# Bio Behaviour State Assessment of Students with Profound Mental Retardation

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**BIO BEHAVIOUR STATE ASSESSMENT OF STUDENTS WITH PROFOUND MENTAL RETARDATION**

*Other Usefull Publications :*

- Functional Assessment Checklist for Programming ot Students with Profound Mental Retardatin (FACP-PMR) - 2004

- Teaching Students with Profound Mental Retardation
  A Guide for Teachers and Parents - 2007

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# Preface

Teaching children with profound mental retardation is a challenge to teachers and professionals as they have less learning potential when compared to other categories of children with mental retardation. In addition they have one or the other associated problems such as epilepsy, visual or hearing impairment and or stiffness in muscles. These problems further pictures them as the most difficult group to deal with and at times the trainers get dejected as they do not see improvement in the children. From the literature it is also noted that children with profound mental retardation in the classrooms were less responsive to the stimulus or on going programme in the class room as most of the times they found to be drowsy due to the medication.

To learn one needs to attend to / concentrate on the stimulus / event going on in the classroom for which one needs to be alert and active. Often teachers may be training the students when they are not alert and active that results in zero learning. In addition the teaching learning environment should be such that it evokes spontaneous response from the learner. The teaching learning environment includes teaching materials, the positioning, seating arrangement and the methodology of teaching. A number of research studies are conducted to find out the impact of alert and active state on learning. The results indicated that, identifying environmental factors, and the time of the day during which the child is in alert active state. Instructing the students with profound mental retardation using this information resulted in greater achievement of skills among children with profound mental retardation.

Guess, Thompson and Rues, (1987) applied systematic procedures to identify the alert active state of an individual with profound mental retardation. The same methodology was adapted in conducting the behavioural state assessment of children with profound mental retardation.

The Bio behavioral state assessment includes observation and recording of the response to various stimuli. The observation and recording was carried out during the day placing the child in different positions, interacting with different materials, and persons to find out the environmental factors and the time of the day during which the child is active and alert. Most of the children found to be alert during feeding time. There were variations in responding to the materials. Some responded to soft toys, and the others to music and the sound and light producing toys. The positioning depended on the students physical problems.

In this book we have explained in detail a) the concept of Bio Behavior state, and the explanation of each state, b) the conduct of behavioual assessment and recording the observations, and c) step by step analysis of states using computer and also doing manually.

Well, it is a bit lengthy process to begin with, but it does help greatly in planning the instruction which maximizes the learning among children with profound mental retardation. We appreciate the feed back from the users.

*Vijayalakshmi Myreddi*

# Acknowledgements

# Chapter-1

# Bio Behaviour State Assessment

## Introduction

The education of children with profound mental retardation is often viewed as a difficult task by the teachers/parents/caregivers due to the complex nature of the condition. Apart from mental retardation, children with profound mental retardation suffer from physical and health problems and some of them with sensory deficits too. With these problems, they present a picture that they are not capable of learning any task. But the research literature demonstrated that children with profound mental retardation are capable of learning basic skills within their capacities when special techniques and strategies are employed as per individual child's needs. Behaviour modification techniques are extensively used in training students with profound mental retardation. However, it is observed that many students with profound mental retardation show minimal alertness and responsiveness to stimuli in the environment that affects learning.

Guess, Thompson and Rues (1987) stated that many students with profound mental retardation observed in class rooms were unresponsive to stimulus or ongoing program in the class room. They often appeared to be drowsy and or in the state of agitation, stress and discomfort. Due to this children with profound mental retardation are unable to pay attention to and concentrate on tasks taught by the teacher where by children are not learning to their optimum. To maximize learning, it is essential to identify the characteristics and learning styles that lead to appropriate programming. With in this context assessment of bio behavioural state conditions is considered as a potential approach in better understanding of the behavioural and learning characteristics of children with profound mental retardation. Bio behaviour state assessment indicates the periods during which the child is alert and active, and responsiveness to learning environmental variables such as material, modality, place, position and persons interacting. This data helps teacher in understanding the behavioural and learning characteristics of children with profound mental retardation.

Research studies reported on states indicated its influence on development and learning of students with severe profound disabilities (Guess et al 1988, Guess et al 1990,

Roberts, Siegel-Causey et al, 1992, Guess et al 1993, Guy, Gue and Ault, 1993, Robert). The results showed that the state conditions have impact on alertness and responsiveness of children and youth with severe and profound disabilities and has direct influence on learning and development. Development of state profiles and the patterns of relationship of physiological and environmental variables in teaching programs for children with severe profound disabilities proved to have positive results. Further the study by Ault, Guy, Guess, Bashinski and Roberts (1995) reported that the special teachers could learn the techniques of observation and recording of behaviour states and the environmental variables, and could plan class room strategies to increase the desired state and learning of skills among children with profound disabilities.

On the similar lines, the Department of Special Education, NIMH had undertaken a project work on "Education of students with profound mental retardation". The objectives of the project include development of (a) biobehaviour state assessment, (b) functional assessment, (c) planning appropriate strategies and intervention, and (d) evaluation procedures. For conducting biobehaviour assessment of students with profound mental retardation, the materials and procedures developed by Guess et al (1987) were adapted. The details are discussed in the following pages.

## What is bio behaviour state?

Behaviour state is described as a series of behavioural and psychological states ranging from deep sleep to awake and crying among infants (Wolf, 1959).

Behaviour state is organizing overall level of functioning at any given time, on a continuum ranging from deep sleep to awake, alert and active (Brakbill and Fitzerold, 1969).

Behaviour state is expressions of the maturity, status and organization of central nervous system which mediate the child's ability to respond to the environment and stimulation (Helm and Simeonsson, 1989).

Behaviour state is theoretical description of an individual's ability to mediate interactions with the environment, both external and internal. It has a significant influence on levels of awareness and responsiveness, and on learning, development and quality of life (Ault, Grey, Guess, Bashionstin and Roberts, 1995).

It is clear from the above descriptions that the ability to respond to the stimuli has direct influence on learning.

## Bio behaviour State Assessment

In persons with profound mental retardation, bio behaviour states fluctuate rapidly with in a narrow range which may not be obvious. In addition, biochemical components like cortisones, presence of sub clinical epileptic discharge, anti canvulsants and psychotropic drugs influence behaviour states. Therefore, there is a need for bio behaviour state assessment which helps in identifying the periods of alertness and accordingly plan appropriate intervention programme.

## What is bio behaviour state assessment?

Bio behaviour state assessment refers to the process of systematic collection, organization and interpretation of information about an individual's physiological, and environmental variables which mediates or affects his/her interaction with the environment and the capacity to learn basic functional skills.

The objectives of bio behaviour state assessment are as follows:

a)  To systematically collect and code the information on current status of bio behaviour states of students with profound mental retardation.

b)  To analyze the data to identify the periods of alertness and the relationship of physiological and environmental variables to behaviour states.

c)  To develop appropriate intervention programme based on the assessment data.

d)  To evaluate the status of bio behaviour states of children with profound mental retardation after intervention.

# Chapter-II

# Training on conduct of Bio Behaviour State Assessment

The persons who are going to conduct behaviour state assessment should have adequate training in techniques of observation and recording of behaviour states when different environment variables are presented to the child, and analysis and interpretation of data. The training involves the following steps:

## Memorizing the Description of States and Environmental Variables

Firstly the trainees need to be explained the behaviour states and the environmental variables, and the formats used for observation and recording of the data. Following which the trainees should memorize the description of behaviour states and the environment variables.

The description of behaviour states and learning environmental variables given by Guess et al (1988) is as follows:

## A. Definitions of Behaviour States

| Sleep States<br><br>Indeter-minate States<br><br>Preferred Awake States<br><br>Other Awake States | **S¹: Asleep-Inactive**<br>Person's eyes are closed. Respiration is relatively slow and regular. Exhibits little or no motor activity (startle, mouthing, brief limb/body movements)<br><br>**DR: Drowsy**<br>Person's eyes are either open and eyelids appear "heavy" or eyes are opening/closing repeatedly. Vocalizations may occur.<br><br>**A¹: Awake Inactive-Alert**<br>Person's eyes are open and some active visual or auditory orientation, focusing or tracking is displayed (oriented/focused on stimuli, turning head, eyes towards stimuli, or following stimuli). Motor movements (that are not orienting) may occur such as brief limb/body movements, startles). Demonstrates regular respiration. Vocalizations may occur. | **S²: Asleep-Active**<br>Person's eyes are closed. Respiration is generally uneven. Spordic movements (tossing and turning, head and limb twitching), may occur but muscle tone generally low between movements. Person may exhibit rapid eye movements (REM). Other behaviours may include facial expressions (smile, grimaces, frowns) and/or vocalizations (sighs, grunting, gurgling).<br><br>**DA: Daze**<br>Non orientation to visual, auditory, or tactile stimuli predominates. If person's vision is intact eyes are open and appear glass, dull, and immobile. Motor movements (that are not orienting) may occur such as brief limb/body movements, startles). Respiration is regular.<br><br>**A²: Awake Active-Alert**<br>Person attempts to engage/interact using visual, auditory, or tactile modes. If person's vision is intact eyes are open, bright, and shiny. Visual, auditory, or tactile interaction patterns are exhibited with distinct fine and gross motor movements (reaching, leaning towards/away, moving towards/away, eating, touching, etc.). Vocalizations may occur. |

| A²/S: Awake-Active/Stereotypy | C/A: Crying/Agitated |
|---|---|
| Person exhibits behaviours of A² with movements that are self stimulatory or stereotypical (idiosyncratic, repetitive rhythmic movements of body or body parts). Movements may include head weaving, rocking, mouthing hand or objects, arm and finger flapping. | Person may exhibit intense vocalizing, crying, or screaming. Self injurious behaviour possible. Respiration may be irregular and eyes may be open or closed. Intense motor activity possible. |

## B. Definitions of Learning Environmental Variables

The learning environmental variables include Materials, Modality, Activity, Social Contact and Positions.

## 1. Materials

The areas to be measured here are the availability (presence) or non availability (absence) of material.

Availability of materials means the presence of the material to the student i.e. the material presented is with in a touching distance, able to be seen, or loud enough to be heard by the student depending on the properties of the material and student's available modalities (visual, tactile, auditory).

Non-availability of material means the absence of material i.e. the material is not presented to the student or it is beyond touch, out of visual range, or sound is too soft to be heard. The assessor has to record whether the material was present or absent during the occurrence of a specific state.

## 2. Modality

This measure is intended to record the primary modality of the material (eg. tape recorder – auditory; soft toy – tactile; bright red colour toy – visual; soft toy with music – tactile and auditory; bright colour toy with music – visuals and auditory). The input can be through single, double or multimodalities.

The following are the modalities through which the material can be presented.

| Tactile | Smell | Tactile and Auditory | Tactile and Visual and Auditory |
|---|---|---|---|
| Auditory | Taste | Tactile and Visual | |
| Visual | Vestibular | Visual and Auditory | |

## 3. Activity

Domestic Activities : Any activity which would typically occur in a home or home like environment or would be a component of personal needs. Those activities that include are helping mother in arranging, fetching items during mealtime, pouring water into glasses, sorting vegetables and placing them in bags, wiping and taking glass for drinking.

Downtime : Any time the student is not given the opportunity to be involved in an activity.

Eating/Drinking: It includes any active or passive eating or drinking during breakfast, lunch, dinner or snack. Tube-feeding also falls under this category if no other activity is being done with the student.

Leisure/Recreational Activities : Those activities, whether instructional or not, that are done with or by the student for fun. These might include playing with toys, playing games, looking at pictures, drawing, coloring, listening to music, crafts.

Transit : Includes any time the student is in transit in something other than a vehicle (ex: being carried, in wheelchair, walking, etc.).

Care giving : Includes any time the student is being cared for by another person and the student is passive. (e.g. diapering, adjusting student's equipment, health procedures, etc.).

## 4. Social Contact

The variables to be measured in this category are who is interacting, the ratio of people in the interaction, and the type of contact that is being made. The people come in contact can be grouped into two categories i.e. **Known persons** (e.g. family members, neighbours, teacher, therapist, classmates), **Unknown persons** (persons who have no contact or rare contact with the student). These persons may either engage the student with some activity or they may just attend to the student.

Engaging : The Known or Unknown person is attempting to interact with the observed student by directly talking, playing, touching him/her. To include looking as an engaging,

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the Known or Unknown person must be making, or attempting to make, direct eye contact with the observed student (typically they are within 3 feet of the student). For e.g. looking directly at the child and talking, or giving a toy to hold, or playing with a ball.

Attending : The Known or Unknown person is touching or looking at the student, but direct attention is focused elsewhere. Talking to the student with out attempting to engage his/her attention or not waiting for some response would be coded as attending. For example, the teacher is working with one student who asks water. The teacher asks the observed student, "How about you, would you like water?" The teacher does not, however, looks at the student or pause to see his/her response, but continues to get the first student a drink. (or) The teacher is telling observed student to hold the toy by moving the toy towards the student (not looking at him) and turning towards another student and talking to him/her.

## 5. Position

Sitting : The student's body is bent at the waist at an angle of at least 45 degrees from a horizontal surface.

Standing : The student is in an upright position that is at least at a 75 degree angle with a horizontal surface and a portion of his/her weight is borne on legs and feet (ankle joints). If student is placed in a prone stander, he/she is coded as standing when the prone stander is elevated to at least a 75 degree angle, and it appears that more of the student's weight is being supported by his/her legs than by the torso.

Side lying : The student is on his/her side. The back can be making contact with a horizontal surface, but the pelvis is rotated with the side of the hip resting on the horizontal surface.

Prone : The student is on his/her stomach with the torso making contact with a horizontal surface.

Supine : The student is on his/her back with the torso making contact with a horizontal surface or his/her body can be bent at the waist at less than a 45 degree angle from a horizontal surface.

Kneeling : The student is on his/her back with the legs being bent at the knees and the knees making contact with a horizontal surface.

# 6. Environments/settings

Select the places, material, equipment required for observation

The places where the child can be observed at home and at school are given below. However, you may also include any other setting which you feel relevant

| **Home** | **School** |
|----------|-----------|
| Drawing room | Inside the classroom |
| Bed room | Outside the classroom |
| Dining hall | Play ground |
| Balcony | Play room |
| Front yard | Therapy room |

Materials required:

- Select the material such as bright coloured toys/sound producing toys, musical toys, soft toys, different sizes of building blocks, balls, rattles, and squeaky toys for interaction / stimulation.

- Pillows, rollers, bed, mat, special chair, wheelchair and standing frame for positioning /placing of the student.

- Stop watch and tape recorder for observation and recording.

# C. Formats for Recording the Data

Specific formats are used for observation and recording the data. The details is are discussed below.

# 1. Data recording sheet

Data recording sheet includes location, states, position, activity, material, social contact. The person has to observe all these variables and record the information objectively during the assessment. 30 observations can be recorded in each data sheet.

# BBS Assessment Data - Sheet

Name ...................................   Number ...................................   Date ...................................

Age ...................   Sex ...................   Primary Location ...................................   Time ...................................

| | S¹ | S² | DR | DA | A¹ | A² | A²S | CA | SZ | | Position & Location | | Activity | Material (Availa bility) | | Material (Primary modality) | Attending engaged | | | | Known-person Unknown-person | |
| | | | | | | | | | | | P | L | | Yes | No | | At | O | E | K | UK | |
| 1 | | | | | | | | | | 1 | | | | | | | | | | | | 1 |
| 2 | | | | | | | | | | 2 | | | | | | | | | | | | 2 |
| 3 | | | | | | | | | | 3 | | | | | | | | | | | | 3 |
| 4 | | | | | | | | | | 4 | | | | | | | | | | | | 4 |
| 5 | | | | | | | | | | 5 | | | | | | | | | | | | 5 |
| 6 | | | | | | | | | | 6 | | | | | | | | | | | | 6 |
| 7 | | | | | | | | | | 7 | | | | | | | | | | | | 7 |
| 8 | | | | | | | | | | 8 | | | | | | | | | | | | 8 |
| 9 | | | | | | | | | | 9 | | | | | | | | | | | | 9 |
| 10 | | | | | | | | | | 10 | | | | | | | | | | | | 10 |
| . | | | | | | | | | | . | | | | | | | | | | | | . |
| . | | | | | | | | | | . | | | | | | | | | | | | . |
| . | | | | | | | | | | . | | | | | | | | | | | | . |
| 30 | | | | | | | | | | 30 | | | | | | | | | | | | 30 |

SOCIAL CONTACT

BBS-Bio Behaviour State

## 2. Time schedule and duration

Prepare a time schedule which is representative of a week. The observation has to be carried out for a period of five days. Every day include a minimum of 8 sessions for observation. The duration of each session is about 30 minutes. Identify 4 sessions in the morning and 4 sessions in the afternoon. There can be variations in the timings for observations. The time schedule is given below: You can extend morning or evening time before 8.00 A.M. or after 4.00 P.M. as per your requirement.

### Time schedule

|              | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY |
|--------------|--------|---------|-----------|----------|--------|
| 8.00-8.30    |        |         |           |          |        |
| 8.30-9.00    |        |         |           |          |        |
| 9.00-9.30    |        |         |           |          |        |
| 9.30-10.00   |        |         |           |          |        |
| 10.00-10.30  |        |         |           |          |        |
| 10.30-11.00  |        |         |           |          |        |
| 11.00-11.30  |        |         |           |          |        |
| 11.30-12.00  |        |         |           |          |        |
| 12.00-12.30  |        |         |           |          |        |
| 12.30-1.00   |        |         |           |          |        |
| 1.00-1.30    |        |         |           |          |        |
| 1.30-2.00    |        |         |           |          |        |
| 2.00-2.30    |        |         |           |          |        |
| 2.30-3.00    |        |         |           |          |        |
| 3.00-3.30    |        |         |           |          |        |
| 3.30-4.00    |        |         |           |          |        |
| 4.00-4.30    |        |         |           |          |        |

# D. Process of Conducting Assessment

Two persons are required for conducting behaviour state assessment. One to interact with student and another to observe the state and record the data. Family members can be involved in stimulating/interacting with the child with different material, and in different positions and the assessor can observe and record the behaviour. The assessor has to observe the behaviour for 10 seconds and should take only 5 seconds to record the state. We can also video record the interactions and later can be viewed to record the states. Stop watch can be used for noting the behaviour at regular intervals or we can pre record the intervals using tape recorder and play it recording the behaviour.

Firstly the trainer will demonstrate the process of stimulation, and observation and recording of behaviour states. Following the demonstration and guided practice, the trainees will be asked to observe and record the states while the trainer and/or the family member interacts with the child with different material in different positions, settings, persons and timings. The training should be continued till the inter observer reliability is established between the trainees is 80% and above. It is suggested that the trainees should observe and record the behaviour states for at least a minimum of 10 sessions. Once the trainees achieve the proficiency to the set standards, they are ready for taking up bio behaviour state assessment independently.

## Inter-Observer Reliability

Inter observer reliability is also called as inter coder, inter rater or inter scorer reliability. Inter observer reliability arises when there are several observers, raters or coders of information. In a sense each person who is observing is an indicator. A measure is reliable if the observers or coders agree with each other. Inter observer reliability is tested by having several observers measure the exact same thing and then comparing the measures. It is a common type of reliability reported in content analysis studies, but it can be used whenever multiple rates or coders or observers are involved. Attainment of a high degree of observer reliability is a crucial requirement for the study. If the data are highly reliable, we will be able to detect small as well as large changes produced in the target behaviour. Failure to check the reliability of the data may result in data of questionable accuracy, which consequently would be meaningless. Steps for calculating inter-observer reliability:-

1. After coding the data in the data sheet, prepare the table as shown below for entering the data on behaviour states by the two observers.

Table for data entry on behaviour states

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
|---|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| OA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| OB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

2. The observers should check one another's data sheets *immediately* **after** the session is over while behavior incidence are still fresh in their mind to come to an agreement regarding the behaviour states.

3. Enter score 1 for an agreement of correct coding of the behaviour state and 0 for incorrect coding of the behaviour state in the table.

Data Entry Form of Behaviour States

N=30

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
|---|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| OA | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| OB | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

OA – Observer-A, OB – Observer-B

4. Prepare a two by two summary table with four cells called A, B, C and D.

A Two by Two Summary Table

| A (1,0) | B (1,1) | Total |
|---|---|---|
| C (0,0) | D (0,1) | Total |
| Total | Total | **G. Total** |

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5. Count the number of observations for which **observer-A**'s score is **1** and **observer-B**'s score is **0. Enter the number** in cell A (1, 0).

6. Count the number of observations for which **both observers** score is **1.** Enter this number in cell B (1, 1).

7. Count the number of observations for which **both observers** score is **0.** Enter this number in cell C (0, 0).

8. Count the number of observations for which **observer-A** score is **0** and **observer-B** score is **1.** Enter this number in cell D (0, 1).

9. Add the rows and columns and put the total in the respective rows and columns The grand total should be same as the number of observations.

10. Calculate the percentage of agreement using the following formula:

$$\% \text{ of agreement} = \frac{B + C}{A+B+C+D} \times 100$$

**Example-1:**

## Data Entry Form of Behaviour States

|    | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
|----|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| OA | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1  | 1  | 0  | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 0  | 1  | 0  | 1  | 0  | 1  | 1  | 1  | 0  | 1  | 1  |
| OB | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1  | 1  | 1  | 1  | 0  | 1  | 0  | 1  | 0  | 1  | 0  | 1  | 0  | 1  | 1  | 1  | 0  | 1  | 0  | 1  | 1  |

OA – Observer-A, OB – Observer-B

## Two by Two Summary Table

| A | B | |
|---|---|---|
| 6 | 16 | 22 |
| **C** | **D** | |
| 4 | 4 | 8 |
| 10 | 20 | 30 |

A=(1,0)
B=(1,1)
C=(0,0)
D=(0,1)

$$\% \text{ of agreement} = \frac{B + C}{A+B+C+D} \times 100$$

$$\% \text{ of agreement} = \frac{16+4}{6+16+4+4} \times 100 = \frac{20}{30} \times 100 = 66.6\%$$

**Example-2:**

Data Entry Form of Behaviour States

N=30

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OA | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| OB | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 |

OA – Observer-A, OB – Observer-B

Table – 2 Two by Two Summary Table

| A | B | |
|---|---|---|
| 3 | 23 | 26 |
| C | D | |
| 2 | 2 | 4 |
| 5 | 25 | 30 |

A=(1,0)
B=(1,1)
C=(0,0)
D=(0,1)

$$\% \text{ of agreement} = \frac{B + C}{A+B+C+D} \times 100$$

$$\% \text{ of agreement} = \frac{23+2}{3+23+2+2} \times 100 = \frac{25}{30} \times 100 = 83.3\%$$

Calculate inter-observer reliability for each session in the similar manner as stated above. If the inter-observer reliability established is 80% and above by 4th or 5th session, it is still advised that the observers continue the recording for a minimum of 10 sessions so as to get the correctness and fluency in recording the data.

## Chapter-III

# Data Analysis

The data recorded in BBS data sheet need to be analyzed:

- To find out the occurrence of various behaviour states during the day.

- To identify the timings of the day during which the student is awake-alert-inactive ($A^1$) and awake-alert-active ($A^2$)

- To identify the environmental variables that are responsible for student being in awake-alert-active state ($A^2$)

- To establish the relationship between the response/patterns and the environmental variables.

- To plan appropriate strategies for intervention

For data entry and analysis, Microsoft Excel can be used which is available in Pentium I to IV Computers. If Computers are not available, data entry and analysis can be done manually.

# A. Data Analysis using Computer

## Data entry

Follow the steps given below for entering the data.

1. Prepare the codes for data entry. Follow the code sheet given below for entering the data.

## Code sheet

| TIMINGS | Codes | POSITIONS | Codes |
|---|---|---|---|
| 10.00-10.30 | 1 | Supine | 1 |
| 10.30 - 11.00 | 2 | Supine on lap | 2 |
| 11.14-12.06 | 3 | Prone | 3 |
| 12.06-12.58 | 4 | Prone on bolster | 4 |
| 12.58-1.50 | 5 | Prone on lap | 5 |
| 1.50-2.42 | 6 | Side lying | 6 |
| 2.42-3.34 | 7 | Sitting with support | 7 |
| 3.34-4.26 | 8 | Sitting with out support | 8 |
|  |  | Sitting on lap | 9 |
| STATES |  | Sitting on (wheel) chair | 10 |
| S1 | 1 | Sitting on stool | 11 |
| S2 | 2 | Standing with support | 12 |
| DR | 3 | Standing with out support | 13 |
| DA | 4 | Kneeling | 14 |
| A1 | 5 | Carrying on shoulders | 15 |
| A2 | 6 | Walking with support | 16 |
| A2S | 7 | Walking with out support | 17 |
| C/A | 8 | Crawling | 18 |
| SZ | 9 | Climbing up/down stairs with support | 19 |
| MATERIAL AVAILABILITY |  | Climbing up/down stairs with out support | 20 |
| Yes | 1 |  |  |
| No | 2 | LOCATION |  |
|  |  | Hall | 1 |

17

| MATERIAL MODALITY | | Bed room | 2 |
|---|---|---|---|
| Tactile – T | 1 | Dinning room | 3 |
| Visual – V | 2 | Front yard (open place) | 4 |
| Auditory – A | 3 | Balcony | 5 |
| Smell | 4 | Dark room | 6 |
| Taste | 5 | Therapy room | 7 |
| Vestibular | 6 | Class room | 8 |
| Tactile-Visual- TV | 7 | | |
| Tactile-Auditory- TA | 8 | **ACTIVITY** | |
| Visual-Auditory- VA | 9 | Domestic activities | 1 |
| Tactile-Visual-Auditory – TVA | 10 | Down time | 2 |
| No material | 99 | Leisure/recreational activities | 3 |
| | | Drinking | 4 |
| **SOCIAL CONTACT** | | Eating | 5 |
| Attending | 1 | Transit | 6 |
| No interaction | 2 | Vocational activities | 7 |
| Engage | 3 | Care giving | 8 |
| | | Swinging / Rocking | 9 |
| **PERSON INTERACTION** | | 10 | |
| Known person | 1 | | |
| Unknown person | 2 | | |
| No person | 9 | | |

2. Switch on the computer.

3. Click on **Start** button.
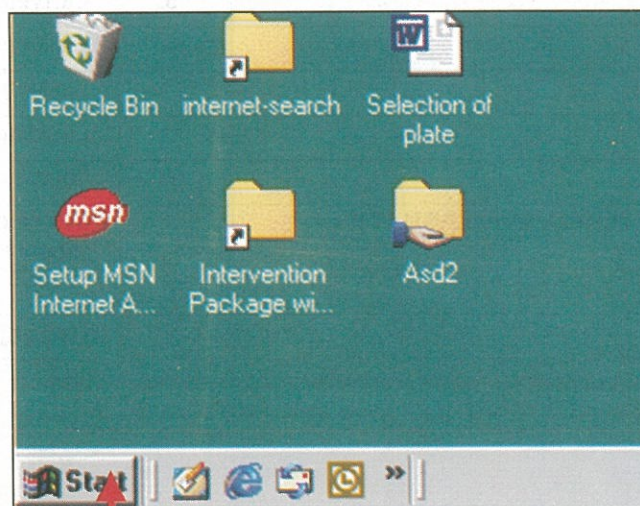
4. Click on **Programs**. Programs menu displays sub menu as shown in figure.

5. Click on **Microsoft Excel.**
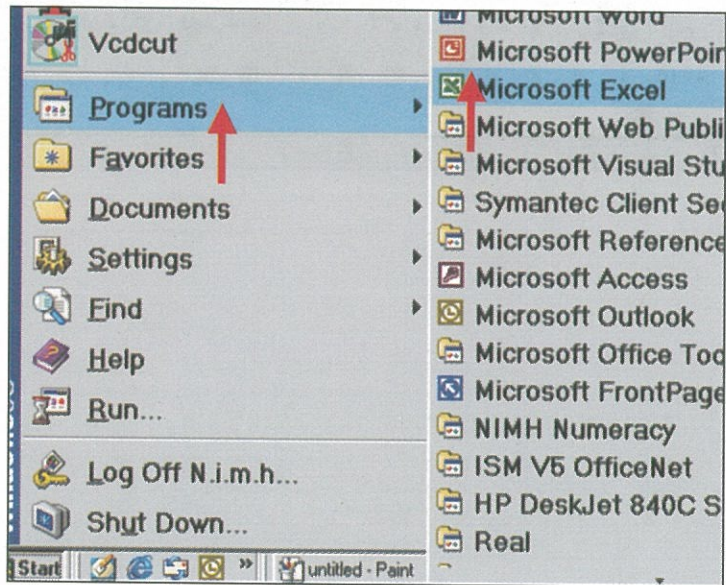


6. It opens as **MS-Excel - Book1**.
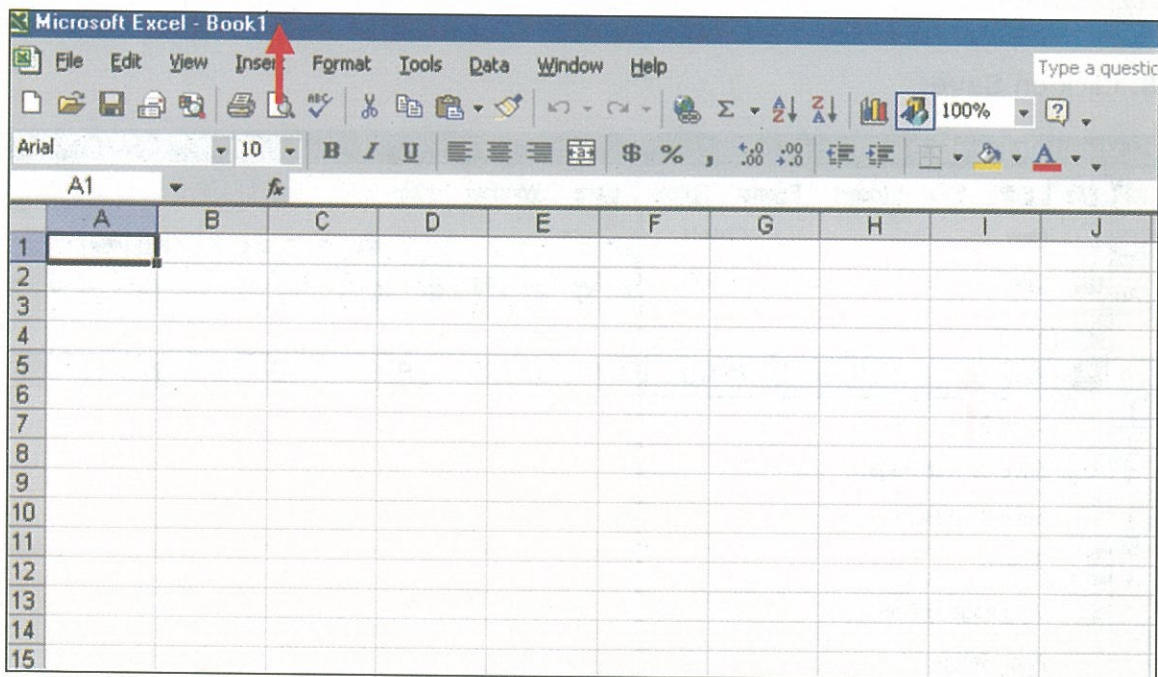
7.    Click on **File.**
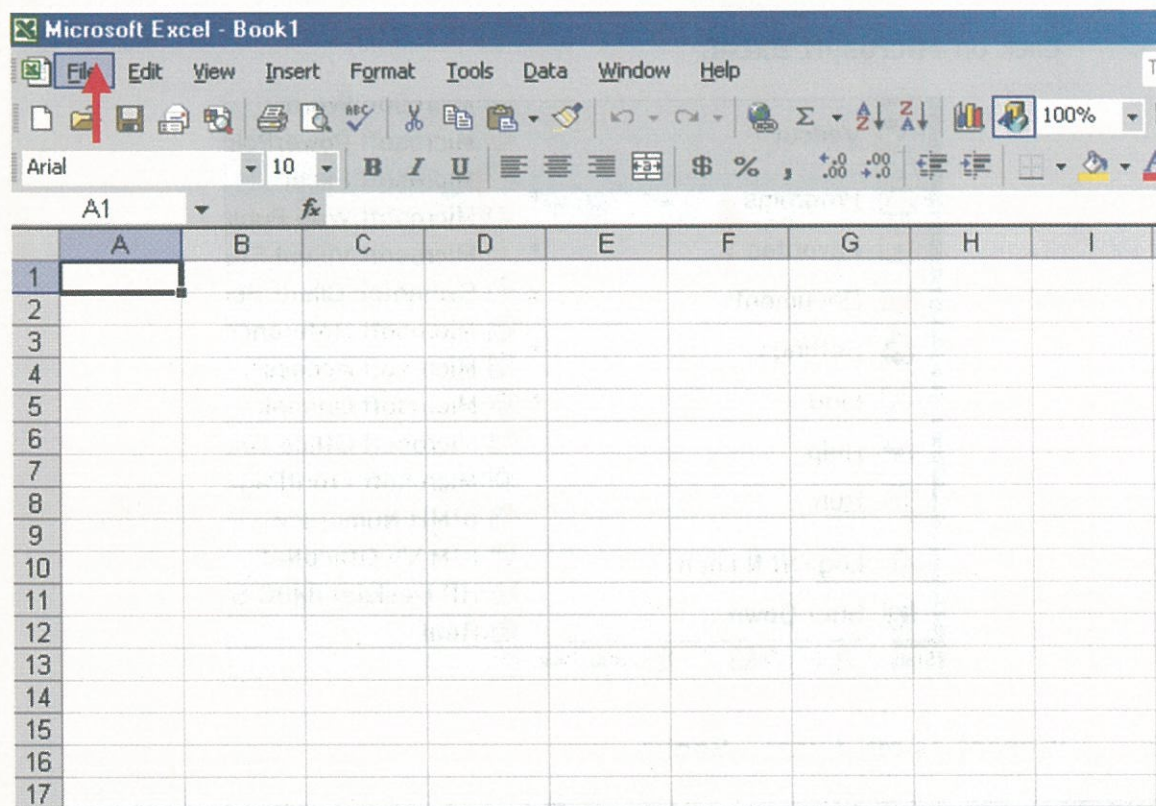


8. Click on **Save.**
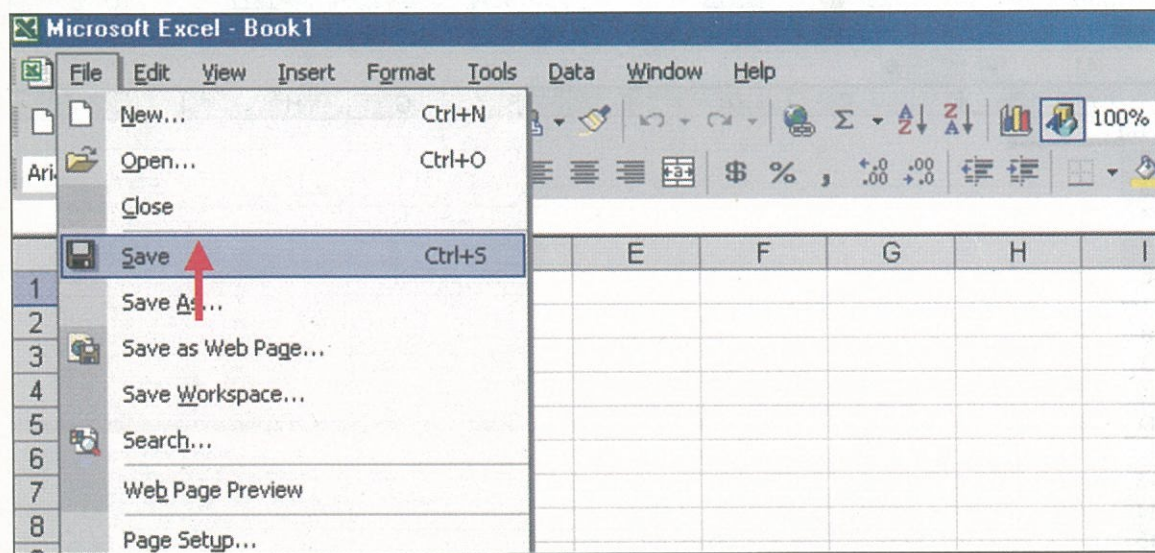
9. When you click on Save, it opens a window as shown below. In that you give file name and then click on 'Save' *button*.
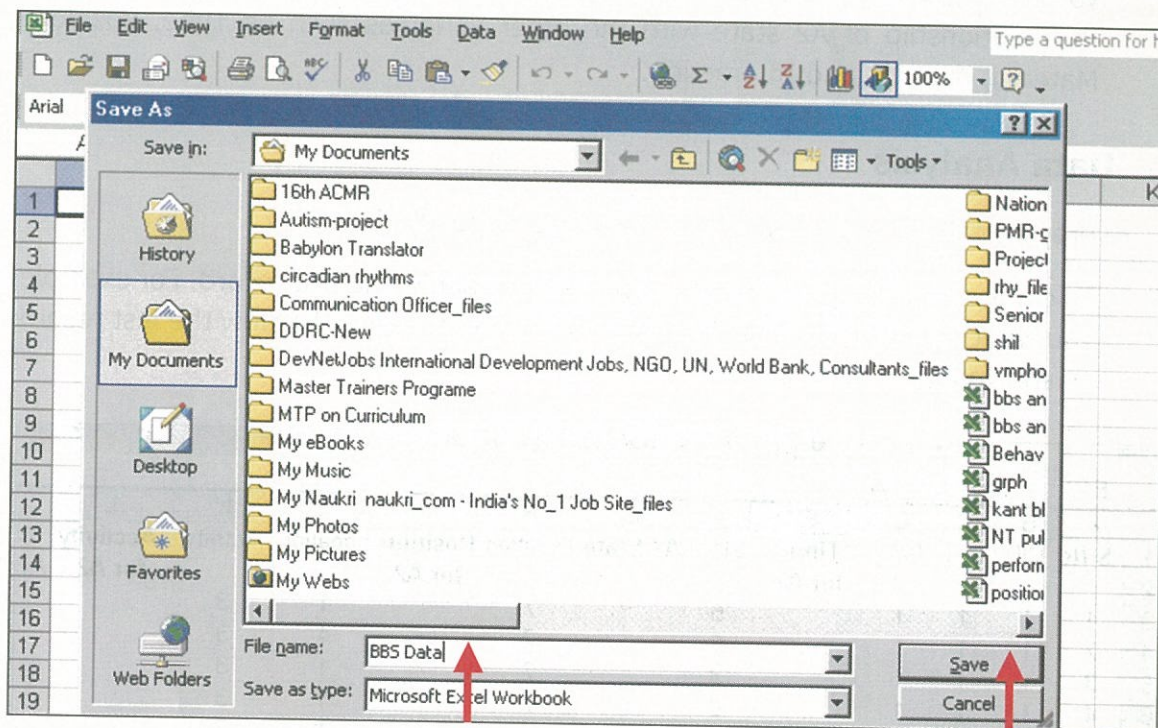


10. After saving the file, enter the data using the code sheet. While entering the data save the data frequently by clinking on the save icon 🖫 or click on **File** menu and then click on **Save.**

11. Enter the headings in the columns as shown below.
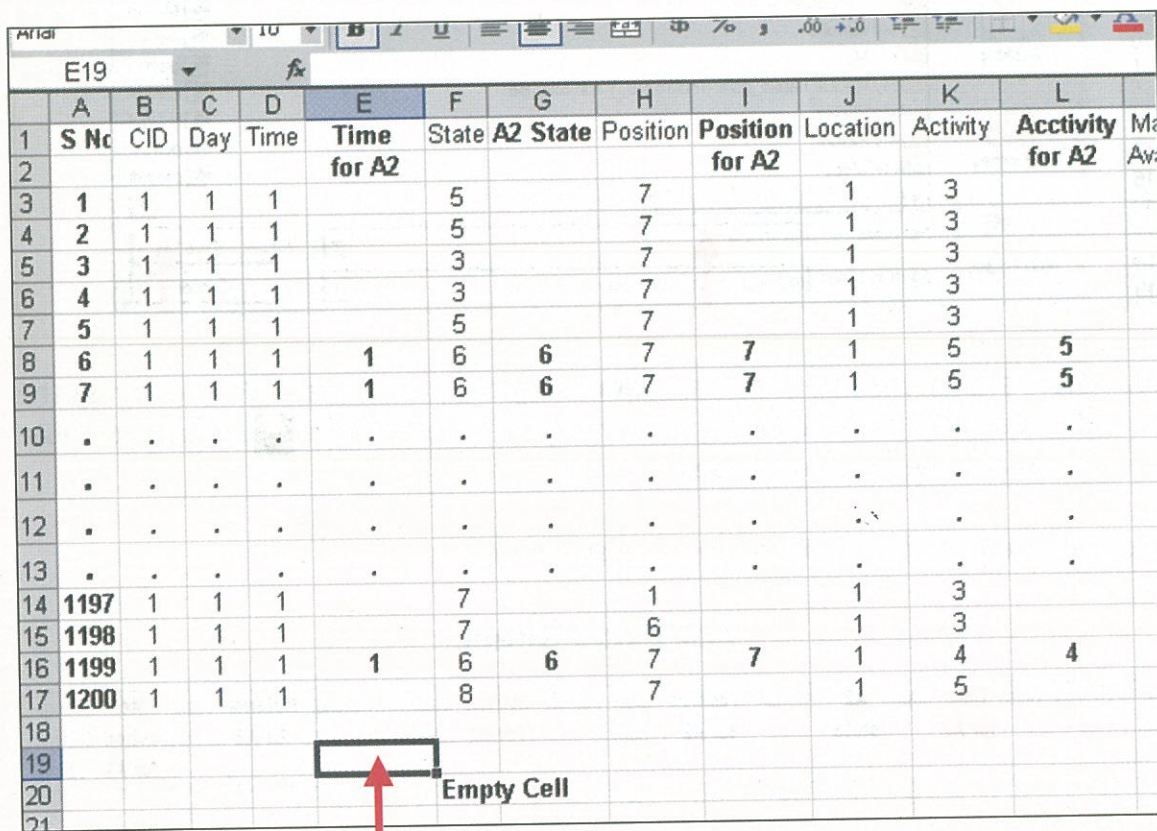
### MS-Excel Sheet

| S. No | CID | Day | Time | Time for A2 | State | A2 state | Position | Position for A2 | Loca- tion | Activity | Activity For A2 | Material Availa- bility | Material modality | Material for A2 | Social contact | Inter- action for A2 | Persons Intern- action |
|-------|-----|-----|------|-------------|-------|----------|----------|-----------------|------------|----------|-----------------|------------------------|-------------------|----------------|----------------|----------------------|-------------------------|
| 1 | 19 | 1 | 1 | | 5 | | 10 | | 8 | 3 | | 1 | 7 | | 3 | | 1 |
| 2 | 19 | 1 | 1 | 1 | 6 | 6 | 10 | 10 | 8 | 3 | 3 | 1 | 7 | 7 | 3 | 3 | 1 |
| 3 | 19 | 1 | 1 | 1 | 6 | 6 | 10 | 10 | 8 | 3 | 3 | 1 | 7 | 7 | 3 | 3 | 1 |
| 4 | 19 | 1 | 1 | | 5 | | 10 | | 8 | 3 | | 1 | 7 | | 3 | | 1 |
| 5 | 19 | 1 | 1 | 1 | 6 | 6 | 10 | 10 | 8 | 3 | 3 | 1 | 7 | 7 | 3 | 3 | 1 |

12. Note that you will find separate columns for entering the data on A2 state with reference to Time, Position, Material, Activity, and Interaction. In these columns you have to enter the data only for A2 state. This data is necessary to identify the relationship of A2 state with the other variables such as Time, Position, Material, Activity, and Interaction.

## B  Data Analysis

1. Prepare tables 1- 4 to enter the data (see Appendix-I).

2. To count a variable click on the empty cell just below the last record. For example you want to count 'time for A2', click on the empty cell just below the last record as shown in the figure.

| | A | B | C | D | E | F | G | H | I | J | K | L | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | S Nc | CID | Day | Time | Time for A2 | State | A2 State | Position | Position for A2 | Location | Activity | Acctivity for A2 | Ma Av |
| 1 | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | |
| 3 | 1 | 1 | 1 | 1 | | 5 | | 7 | | 1 | 3 | | |
| 4 | 2 | 1 | 1 | 1 | | 5 | | 7 | | 1 | 3 | | |
| 5 | 3 | 1 | 1 | 1 | | 3 | | 7 | | 1 | 3 | | |
| 6 | 4 | 1 | 1 | 1 | | 3 | | 7 | | 1 | 3 | | |
| 7 | 5 | 1 | 1 | 1 | | 5 | | 7 | | 1 | 3 | | |
| 8 | 6 | 1 | 1 | 1 | 1 | 6 | 6 | 7 | 7 | 1 | 5 | 5 | |
| 9 | 7 | 1 | 1 | 1 | 1 | 6 | 6 | 7 | 7 | 1 | 5 | 5 | |
| 10 | . | . | . | . | . | . | . | . | . | . | . | . | |
| 11 | . | . | . | . | . | . | . | . | . | . | . | . | |
| 12 | . | . | . | . | . | . | . | . | . | . | . | . | |
| 13 | . | . | . | . | . | . | . | . | . | . | . | . | |
| 14 | 1197 | 1 | 1 | 1 | | 7 | | 1 | | 1 | 3 | | |
| 15 | 1198 | 1 | 1 | 1 | | 7 | | 6 | | 1 | 3 | | |
| 16 | 1199 | 1 | 1 | 1 | 1 | 6 | 6 | 7 | 7 | 1 | 4 | 4 | |
| 17 | 1200 | 1 | 1 | 1 | | 8 | | 7 | | 1 | 5 | | |
| 18 | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | |
| 20 | | | | | | Empty Cell | | | | | | | |
| 21 | | | | | | | | | | | | | |

3. Click on icon *fx*



1. It displays all functions. Select **COUNTIF** function, then click on **OK** button.

2. It asks **Range** and **Criteria**.
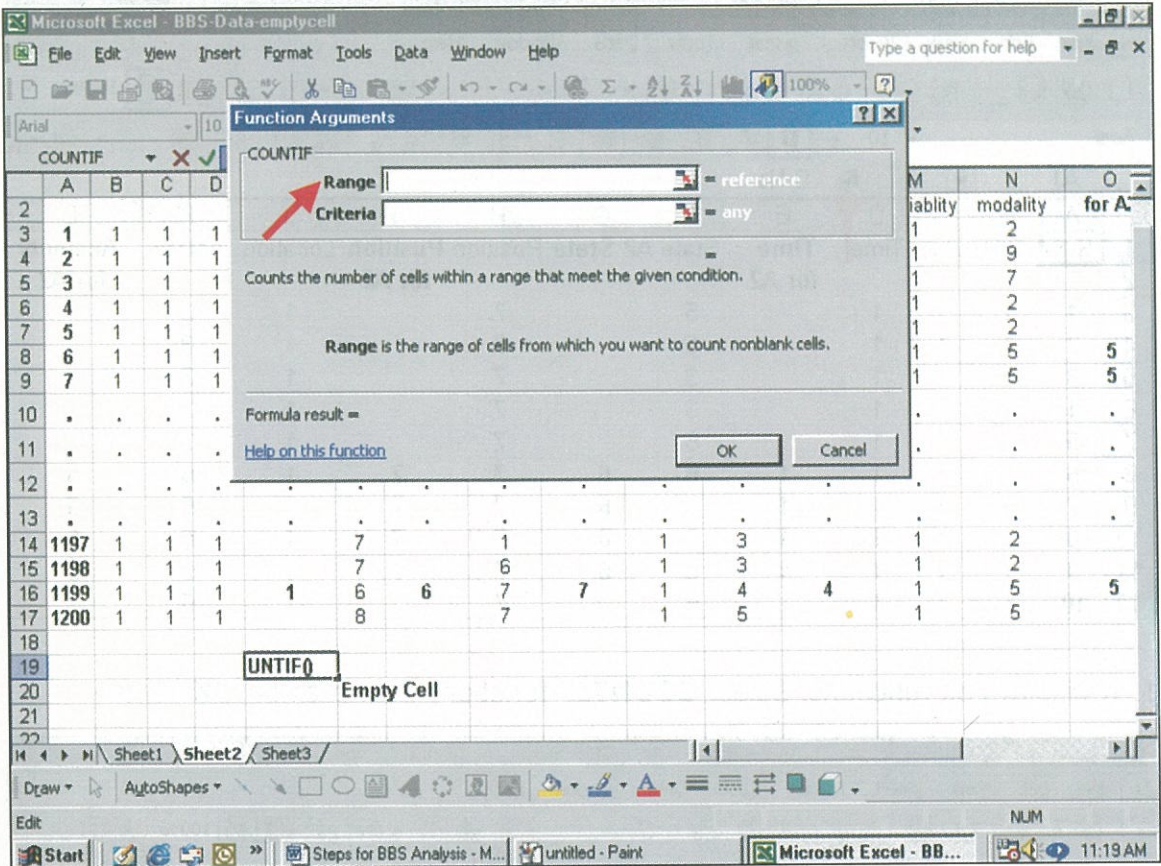
**Range** : Range includes first record to last record. For example if you are calculating time variable for A2 state, select the record from first to last in the column **time for A2.**

**Criteria** : Select the criteria. For example there are 1-8 codes for time variable. If you are calculating for time-1 then give 1 as Criteria, 2 as for time-2 and so on. After giving criteria click on **OK** button.

6.  It displays **count** of that variable in the empty cell for criteria 1.

| 5 | 3 | 1 | 1 | 1 | | 3 | | 7 | | 1 | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | 4 | 1 | 1 | 1 | | 3 | | 7 | | 1 | 3 |
| 7 | 5 | 1 | 1 | 1 | | 5 | | 7 | | 1 | 3 |
| 8 | 6 | 1 | 1 | 1 | 1 | 6 | 6 | 7 | 7 | 1 | 5 |
| 9 | 7 | 1 | 1 | 1 | 1 | 6 | 6 | 7 | 7 | 1 | 5 |
| 10 | . | . | . | . | . | . | . | . | . | . | . |
| 11 | . | . | . | . | . | . | . | . | . | . | . |
| 12 | . | . | . | . | . | . | . | . | . | . | . |
| 13 | . | . | . | . | . | . | . | . | . | . | . |
| 14 | 1197 | 1 | 1 | 1 | | 7 | | 1 | | 1 | 3 |
| 15 | 1198 | 1 | 1 | 1 | | 7 | | 6 | | 1 | 3 |
| 16 | 1199 | 1 | 1 | 1 | 1 | 6 | 6 | 7 | 7 | 1 | 4 |
| 17 | 1200 | 1 | 1 | 1 | | 8 | | 7 | | 1 | 5 |
| 18 | | | | | | | | | | | |
| 19 | | | | 89 | | | | | | | |
| 20 | | | | | | | | | | | |

7.  Enter that **count** in the table and delete the cell to reuse for counting other timings. (For example criteria 2, 3, ...8).

## Table-1 Time - A2 state

| Code No | Time | Total for A2 state (A) | Percentage (%=A/Total*100) |
|---|---|---|---|
| 1 | 10.00 – 10.30 | 32 | 5 |
| 2 | 10.30-11.00 | 74 | 11.6 |
| 3 | 11.00 - 11.30 | 77 | 12.1 |
| 4 | 11.30-12.00 | 122 | 19.1 ** |
| 5 | 12.00-1.00 | 95 | 14.9 |
| 6 | 1.00-1.30 | 72 | 11.3 |
| 7 | 1.30-2.00 | 82 | 12.8 |
| 8 | 2.00-2.30 | 82 | 12.8 |
| | | Total | 636 |

** 11.30- 12.00 the student is more active

8. Calculate the percentages.

9. The highest percentage will indicate the time of the day the student is more active.

10. Prepare the graph using the data.

11. Follow the same procedure to count the other variables.

## Calculating for Positions

a) Calculating positions for A2 state

1. Use COUNTIF function and select the range from first record to the last record in the column "Position for A2".

2. Give the criteria **1** for position-1 (supine). The function gives the number and note it down in the Table-2 against supine position under A2 state.

3. Like this give criteria **2** for position-2 (side lying), criteria **3** for position-3 and so on for same range and note down numbers in Table-2.

### Table-2 Positions – A2 state

| S. No | Positions | A2 state Total (A) | Total (B) | Percentage %=(A/B)*100 |
|---|---|---|---|---|
| 1 | Supine | 88 | | |
| 2 | Side lying | 71 | | |
| 3 | Sitting with support | 17 | | |
| 4 | Sitting with out support | 107 | | |
| 5 | Sitting on chair | 266 | | |
| 6 | Standing with support | 87 | | |
| | Total | 636 | | |

b) Calculating positions for all states:

1. Use COUNTIF function, select the range from first record to last record in the column "Position".

2. Give the criteria **1** for position-1 (supine). The function gives the number and note it down against supine position under column **Total**.

3. Like this give criteria **2** for position-2 (supine on lap), criteria **3** for position-3 and so on for same range and note down numbers in Table-2.

## Table-2  Positions – A2 state

| S. No | Positions | A2 state Total (A) | Total (B) | Percentage %=(A/B)*100 |
|---|---|---|---|---|
| 1 | Supine | 88 | 172 | 51.2 |
| 2 | Side lying | 71 | 131 | 54.2 |
| 3 | Sitting with support | 17 | 31 | 54.8 |
| 4 | Sitting with out support | 107 | 207 | 51.6 |
| 5 | Sitting on a chair | 266 | 457 | 58.2 ** |
| 6 | Standing with support | 87 | 202 | 43.1 |
|  | Total | 636 | 1200 | |

** The student is more active when he was made to sit on a chair.

4. Calculate the percentages and enter in the percentage column(% = A/B*100).

5. The highest percentage will indicate in which position the student is more active.

6. Prepare the graph using the data.

Follow the same procedure to calculate for Material, Activity, and Interaction for A2 state.

## C. Data Analysis Manually

Use the tables from 1 to 53 given in appendix-II. Follow the procedure given below for data analysis.

### Calculating timings for A2 state

1.  Use Table-1 for entering the data. Count the no. of A2's session wise (8 sessions per day) for day-1 and enter the number under column day-1. Count no. of A2's session wise and day wise and enter the number in appropriate columns.

## Table-1

## Time – A2 state

| S. No | Time | Day-1 | Day-2 | Day-3 | Day-4 | Day-5 | Total (A) | Percentage (%=A/GT*100) |
|-------|------|-------|-------|-------|-------|-------|-----------|-------------------------|
| 1 | 10.00 -10.30 | 18 | 3 | 3 | 8 | 0 | 32 | 5 |
| 2 | 10.30 - 11.00 | 11 | 17 | 9 | 23 | 14 | 74 | 11.6 |
| 3 | 11.00 - 11.30 | 12 | 23 | 12 | 21 | 9 | 77 | 12.1 |
| 4 | 11.30 - 12.00 | 27 | 24 | 24 | 22 | 25 | 122 | 19.1 ** |
| 5 | 12.00 - 12.30 | 15 | 18 | 20 | 23 | 19 | 95 | 14.9 |
| 6 | 12.30 - 01.00 | 15 | 4 | 19 | 15 | 19 | 72 | 11.3 |
| 7 | 02.00 - 02.30 | 16 | 17 | 15 | 18 | 16 | 82 | 12.8 |
| 8 | 02.30 - 03.00 | 6 | 18 | 18 | 25 | 15 | 82 | 12.8 |
|  | Total | 120 | 124 | 120 | 155 | 117 | **636 (GT)** | 100 |

** 11.30- 12.00 the student is more active

2.  Make the totals row wise and column wise.

3.  Make the grand total.

4.  Calculate the percentage and enter the percentage (% = A/G.Total*100).

5.  The highest percentage will indicate the time of the day the student is more active

# Calculating Positions

## a) Calculating Positions for A2 state

1. Use Table-2. Count the no. of A2's for each position, session wise (S1-S8) for day-1 and enter the number under appropriate columns. Total the number row wise and column wise.

2. Similarly count no of A2's for each position for five days and enter the data in separate tables.

## Table-2

### Day No. 1

| S.No | Positions | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-----------|----|----|----|----|----|----|----|----|-------|
| 1 | Supine | | 5 | | | | 5 | | | 10 |
| 2 | Side lying | | 4 | | | | 6 | | | 10 |
| 3 | Sitting with support | 10 | | | | | 4 | | 3 | 17 |
| 4 | Sitting with out support | | 2 | 7 | | 3 | | | 3 | 15 |
| 5 | Sitting on chair | 8 | | 5 | 27 | 12 | | 10 | | 50 |
| 6 | Standing with support | | | | | | | 6 | | 18 |
| | Total | 18 | 11 | 12 | 27 | 15 | 15 | 16 | 6 | 120 |

### Day No. 2

| S.No | Positions | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-----------|----|----|----|----|----|----|----|----|-------|
| 1 | Supine | | | 7 | | 10 | | 5 | 10 | 32 |
| 2 | Side lying | | | 8 | | 8 | | 6 | | 22 |
| 3 | Sitting with support | | | | | | | | | 0 |
| 4 | Sitting with out support | | | 10 | | 12 | | 7 | 14 | 43 |
| 5 | Sitting on chair | | 20 | 5 | 30 | | 20 | 12 | 6 | 93 |
| 6 | Standing with support | 30 | 10 | | | | 10 | | | 50 |
| | Total | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 240 |

3. Enter the totals calculated for each day for each position in the table shown below.

## Table-3

| S.No | Positions | Day-1 | Day-2 | Day-3 | Day-4 | Day-5 | Total |
|------|-----------|-------|-------|-------|-------|-------|-------|
| 1 | Supine | 10 | 21 | 19 | 31 | 7 | 88 |
| 2 | Side lying | 10 | 13 | 13 | 27 | 8 | 71 |
| 3 | Sitting with support | 17 | 0 | 0 | 0 | 0 | 17 |
| 4 | Sitting with out support | 15 | 26 | 23 | 27 | 16 | 107 |
| 5 | Sitting on chair | 50 | 53 | 41 | 66 | 56 | 266 |
| 6 | Standing with support | 18 | 11 | 24 | 4 | 30 | 87 |
|  | Total | 120 | 124 | 120 | 155 | 117 | 636 |

## b) Calculating Positions for all states

1.  Use Table-2. Count the no. for each position, session wise (S1-S8) for day-1 and enter the number under appropriate columns. Make the totals row wise and column wise. Column wise total should come **30**.

2.  Similarly count no. for each position for five days and enter the data in separate tables.

## Table-4
### Day No. 1

| S.No | Positions | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-----------|----|----|----|----|----|----|----|----|-------|
| 1 | Supine |  | 11 |  |  |  | 16 |  |  | 27 |
| 2 | Side lying |  | 14 |  |  |  | 8 |  |  | 22 |
| 3 | Sitting with support | 16 |  |  |  |  | 6 |  | 9 | 31 |
| 4 | Sitting with out support |  | 5 | 14 |  | 13 |  |  | 10 | 42 |
| 5 | Sitting on a chair | 14 |  | 16 | 30 |  |  | 39 | 11 | 90 |
| 6 | Standing with support |  |  |  |  | 17 |  | 11 |  | 28 |
|  | Total | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 240 |

S1 - S8 : Session numbers

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3. Enter the totals calculated for each day for each position in the table shown below.

## Table-5

| S.No | Positions | Day-1 | Day-2 | Day-3 | Day-4 | Day-5 | Total |
|------|-----------|-------|-------|-------|-------|-------|-------|
| 1 | Supine | 27 | 32 | 43 | 56 | 14 | 172 |
| 2 | Side lying | 22 | 22 | 27 | 40 | 20 | 131 |
| 3 | Sitting with support | 31 | 0 | 0 | 0 | 0 | 31 |
| 4 | Sitting with out support | 42 | 43 | 40 | 42 | 40 | 207 |
| 5 | Sitting on chair | 90 | 93 | 92 | 89 | 93 | 457 |
| 6 | Standing with support | 28 | 50 | 38 | 13 | 73 | 202 |
| | Total | 240 | 240 | 240 | 240 | 240 | 1200 |

4. Transfer the totals from table-3 and table-5 into table-6 under the columns 'Total of A2 state(A)' and 'Total(B)'.

5. Calculate the percentages.

## Table-6

| S. No | Positions | Total of A2 state (A) | Total (B) | Percentage %=(A/B)*100 |
|-------|-----------|-----------------------|-----------|------------------------|
| 1 | Supine | 88 | 172 | 51.2 |
| 2 | Side lying | 71 | 131 | 54.2 |
| 3 | Sitting with support | 17 | 31 | 54.8 |
| 4 | Sitting with out support | 107 | 207 | 51.6 |
| 5 | Sitting on a chair | 266 | 457 | 58.2 ** |
| 6 | Standing with support | 87 | 202 | 43.1 |
| | Total | 636 | 1200 | |

** The student is more active when he was made to sit on a chair

6. The highest percentage will indicate in which position the student is more active.

Follow the same procedure to calculate for Material, Activity, and Interaction.

## D. Data analysis and interpretation of data sample case study is given below

## CASE STUDY - BBS Analysis

Praneeth, 10/M

## I. A2 state analysis at different Times

Table-1:

| S. NO | TIME | DAY-1 | DAY-2 | DAY-3 | DAY-4 | DAY-5 | TOTAL (A) | PERCENTAGE (%=A/G.T*100) |
|---|---|---|---|---|---|---|---|---|
| 1 | 10.00 – 10.30 | 18 | 3 | 3 | 8 | 0 | 32 | 5 |
| 2 | 10.30-11.00 | 11 | 17 | 9 | 23 | 14 | 74 | 11.6 |
| 3 | 11.00 - 11.30 | 12 | 23 | 12 | 21 | 9 | 77 | 12.1 |
| 4 | 11.30-12.00 | 27 | 24 | 24 | 22 | 25 | 122 * | 19.1 ** |
| 5 | 12.00-1.00 | 15 | 18 | 20 | 23 | 19 | 95 | 14.9 |
| 6 | 1.00-1.30 | 15 | 4 | 19 | 15 | 19 | 72 | 11.3 |
| 7 | 1.30-2.00 | 16 | 17 | 15 | 18 | 16 | 82 | 12.8 |
| 8 | 2.00-2.30 | 6 | 18 | 18 | 25 | 15 | 82 | 12.8 |
| | TOTAL | 120 | 124 | 120 | 155 | 117 | 636 (G.T) | 100 |
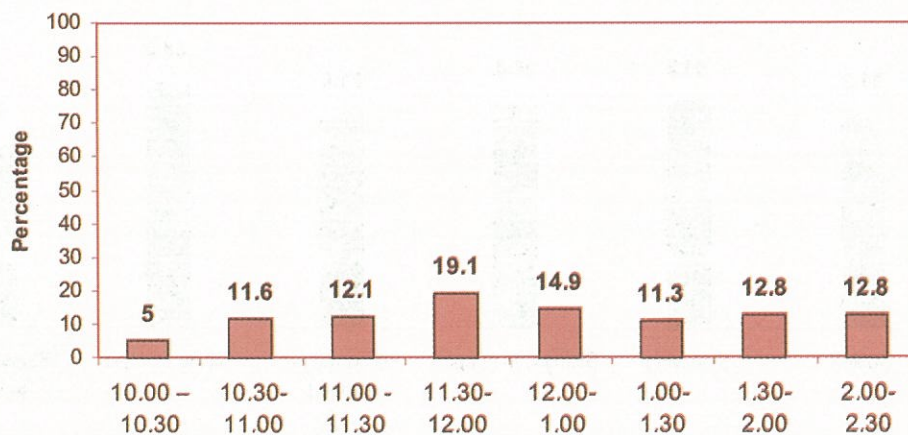


Analysis : He is more active at 11.30 – 12.00 am (19.1 %)

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## II. A2 state analysis in different Positions

Table-2

### Positions – A2 state

| S. No | Positions | A2 state Total (A) | Total (B) | Percentage %=(A/B)*100 |
|---|---|---|---|---|
| 1 | Supine | 88 | 172 | 51.2 |
| 2 | Side lying | 71 | 131 | 54.2 |
| 3 | Sitting with support | 17 | 31 | 54.8 |
| 4 | Sitting with out support | 107 | 207 | 51.6 |
| 5 | Sitting on a chair | 266 | 457 | 58.2 * |
| 6 | Standing with support | 87 | 202 | 43.1 |
| | **Total** | **636** | **1200** | |



A2 state in different Positions

Analysis: He is more active in Sitting on chair Position (58.2%)

# III. A2 state analysis with different Materials

Table-3

| S. No | Materials | A2 state Total (A) | Total (B) | Percentage %=(A/B)*100 |
|---|---|---|---|---|
| 1 | Tactile (T) | 25 | 58 | 43.1 |
| 2 | Visual (V) | 104 | 203 | 51.2 |
| 3 | Auditory (A) | 149 | 184 | 80.9 * |
| 4 | Taste | 123 | 150 | 82.0 * |
| 5 | Tactile-Visual | 57 | 120 | 47.5 |
| 6 | Tactile-Auditory | 7 | 35 | 20.0 |
| 7 | Visual-Auditory | 115 | 224 | 51.3 |
| 8 | Tactile-Visual-Auditory | 44 | 90 | 48.8 |

### A2 state in different Positions



Analysis: He is more active with Food (Taste, 82%) and Auditory material (80.9%)

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## IV. A2 state analysis in different Activities

Table-4

| S. No | Activities | A2 state Total (A) | Total (B) | Percentage %=(A/B)*100 |
|-------|-----------|-------------------|-----------|------------------------|
| 1 | Down time | 0 | 91 | 0 |
| 2 | Leisure | 513 | 959 | 53.5 |
| 3 | Drinking | 35 | 38 | 92.1 * |
| 4 | Eating | 88 | 112 | 78.6 * |

**A2 state with different Materials**
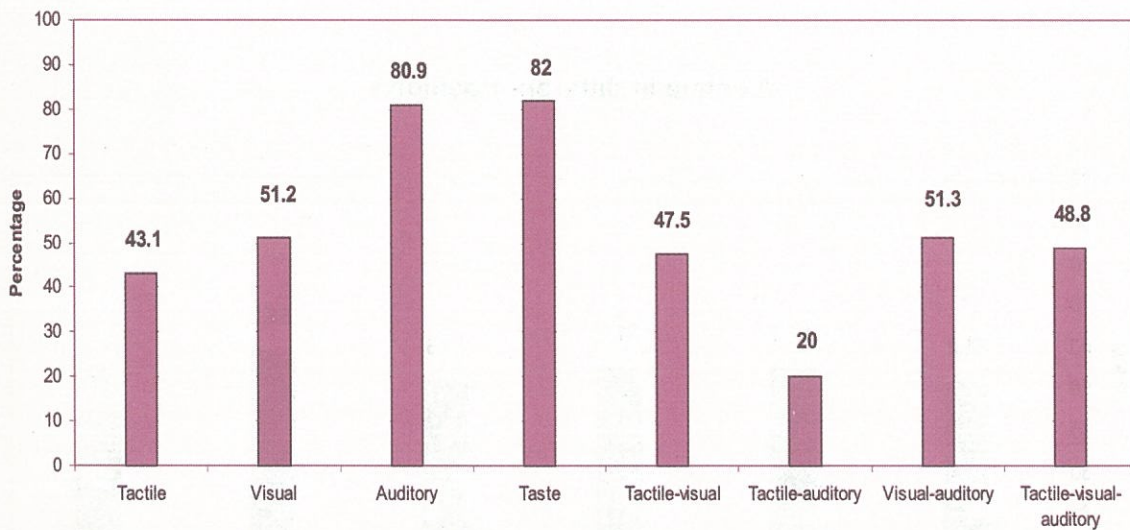


Analysis: He is more active during Drinking (92.1%) and Eating (78.6%) activities.

## V. A2 state analysis with different Interaction.

Table-5

| S. No | Interaction | A2 state Total (A) | Total (B) | Percentage %=(A/B)*100 |
|---|---|---|---|---|
| 1 | Attending | 60 | 103 | 58.2 * |
| 2 | Engaging | 497 | 898 | 55.3 |

**A2 state in different Activities**
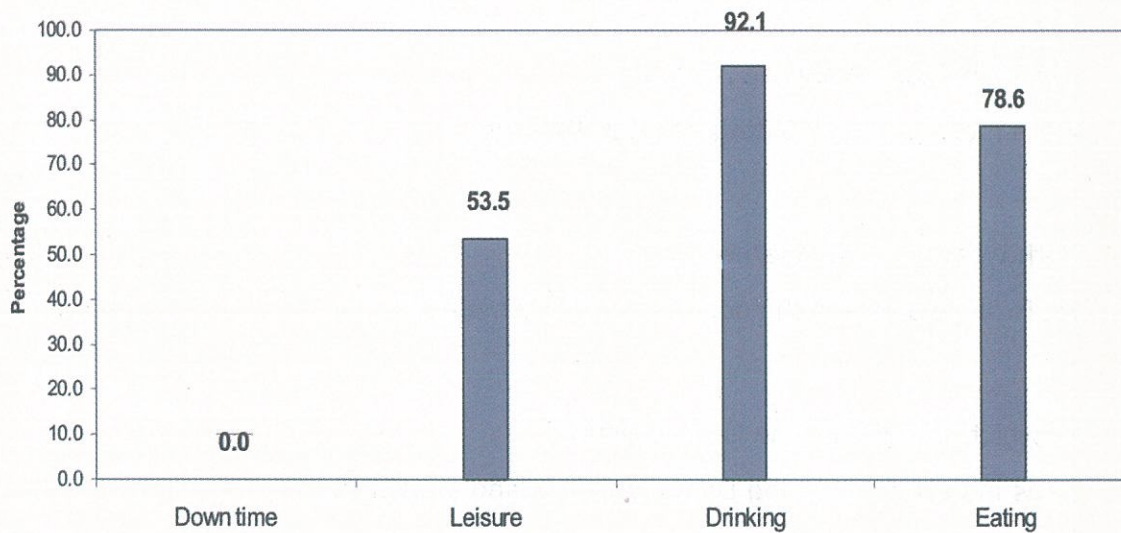


Analysis : He is more active when he is Attended during Interaction (58.2%).

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# Analysis and interpretation of Bio-Behaviour States

**Case ID**   :   **19**

**Name**      :   **Praneeth**

**Age/sex**   :   **10/M**

**Reg.No**    :   **957/2000**

1.   Which part of the day she/he is active?

     He is more active at 11.30 – 12.00 am

2.   In which position she/he is active?

     He is more active in Sitting on chair Position

3.   With what material she/he is active?

     He is more active with Food and Auditory material

4.   In which activity she/he is more active?

     He is more active during Drinking and Eating activities.

5.   Which type of interaction (person) she/he is active?

     He is more active when he is Attended during Interaction

# References :

Ault, M. M., Guy, B., Guers D., Bashinski, S., and Roberts, S. (1995). Analyzing Behavior State and Learning Environments: Application in Instructional Settings. Journal on Mental Retardation, 33, 5, 304-316.

Guess, D., Ault, M.M., Roberts, S., Struth, J., Siegel Causey, E., Thompson, B., Bronicki, G.J., & Guy, B. (1988). Implications of biobehaviour states for the education and treatment of students with the most profoundly handicapping conditions. The Journal of the Association for Persons with Severe Handicaps, 13, 163-174.

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# BBS Assessment Data - Sheet

Name ..................................  Number ..................................  Date ..................................

Age ..................  Sex ..................  Primary Location ..................................  Time ..................................

| | S¹ | S² | DR | DA | A¹ | A² | A²S | CA | SZ | | Position & Location | | Activity | Material (Availability) | | Material (Primary modality) | SOCIAL CONTACT | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | P | L | | Yes | No | | Attending engaged | | | Known-person | Unknown-person | | |
| | | | | | | | | | | | | | | | | | At | O | E | K | UK | | |
| 1 | | | | | | | | | 1 | | | | | | | | | | | | | 1 | |
| 2 | | | | | | | | | 2 | | | | | | | | | | | | | 2 | |
| 3 | | | | | | | | | 3 | | | | | | | | | | | | | 3 | |
| 4 | | | | | | | | | 4 | | | | | | | | | | | | | 4 | |
| 5 | | | | | | | | | 5 | | | | | | | | | | | | | 5 | |
| 6 | | | | | | | | | 6 | | | | | | | | | | | | | 6 | |
| 7 | | | | | | | | | 7 | | | | | | | | | | | | | 7 | |
| 8 | | | | | | | | | 8 | | | | | | | | | | | | | 8 | |
| 9 | | | | | | | | | 9 | | | | | | | | | | | | | 9 | |
| 10 | | | | | | | | | 10 | | | | | | | | | | | | | 10 | |
| 11 | | | | | | | | | 11 | | | | | | | | | | | | | 11 | |
| 12 | | | | | | | | | 12 | | | | | | | | | | | | | 12 | |
| 13 | | | | | | | | | 13 | | | | | | | | | | | | | 13 | |
| 14 | | | | | | | | | 14 | | | | | | | | | | | | | 14 | |

## SOCIAL CONTACT

| | S¹ | S² | DR | DA | A¹ | A² | A²S | CA | SZ | |
|---|---|---|---|---|---|---|---|---|---|---|
| 15 | | | | | | | | | | 15 |
| 16 | | | | | | | | | | 16 |
| 17 | | | | | | | | | | 17 |
| 18 | | | | | | | | | | 18 |
| 19 | | | | | | | | | | 19 |
| 20 | | | | | | | | | | 20 |
| 21 | | | | | | | | | | 21 |
| 22 | | | | | | | | | | 22 |
| 23 | | | | | | | | | | 23 |
| 24 | | | | | | | | | | 24 |
| 25 | | | | | | | | | | 25 |
| 26 | | | | | | | | | | 26 |
| 27 | | | | | | | | | | 27 |
| 28 | | | | | | | | | | 28 |
| 29 | | | | | | | | | | 29 |
| 30 | | | | | | | | | | 30 |
| | S¹ | S² | DR | DA | A¹ | A² | A²S | CA | SZ | |
| Total | | | | | | | | | | |

| | Position & Location | | Activity | Material (Availability) | | Material (Primary modality) | Attending engaged | | | | | Known-person Unknown-person | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | P | L | | Yes | No | | At | O | E | K | UK | | |
| | | | | | | | | | | | | | 15 |
| | | | | | | | | | | | | | 16 |
| | | | | | | | | | | | | | 17 |
| | | | | | | | | | | | | | 18 |
| | | | | | | | | | | | | | 19 |
| | | | | | | | | | | | | | 20 |
| | | | | | | | | | | | | | 21 |
| | | | | | | | | | | | | | 22 |
| | | | | | | | | | | | | | 23 |
| | | | | | | | | | | | | | 24 |
| | | | | | | | | | | | | | 25 |
| | | | | | | | | | | | | | 26 |
| | | | | | | | | | | | | | 27 |
| | | | | | | | | | | | | | 28 |
| | | | | | | | | | | | | | 29 |
| | | | | | | | | | | | | | 30 |

Targeted Skills (if any) : _____
_____

COMMENTS :

# Tables for Data Analysis with Computer

Table-1                                    **Time – A2 state**

| S. No | Time | Total for A2 state (A) | Percentage (%=A/Total*100) |
|---|---|---|---|
| 1 | 10.00 – 10.30 | | |
| 2 | 10.30 - 11.00 | | |
| 3 | 11.00 - 11.30 | | |
| 4 | 11.30 -12.00 | | |
| 5 | 12.00 -12.30 | | |
| 6 | 12.30 - 01.00 | | |
| 7 | 02.00 – 02.30 | | |
| 8 | 02.30 – 03.00 | | |

Table-2                                    **Positions – A2 state**

| S. No | Position | A2 state Total (A) | Total (B) | Percentage %=(A/B)*100 |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| | **Total** | | | |

Table- 3               **Materials – A2 state**

| S. No | Materials | A2 state Total (A) | Total (B) | Percentage %=(A/B)*100 |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| | **Total** | | | |

Table-4              **Activities – A2 state**

| S. No | Activities | A2 state Total (A) | Total (B) | Percentage %=(A/B)*100 |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| | **Total** | | | |

Table-5              **Interaction – A2 state**

| S. No | Interaction | A2 state Total (A) | Total (B) | Percentage %=(A/B)*100 |
|---|---|---|---|---|
| 1 | Attending | | | |
| 2 | Engaging | | | |
| | **Total** | | | |

# Tables for Data Analysis Manually

**Table-1**                **Time – A2 state**

| S. No | Time | Day-1 | Day-2 | Day-3 | Day-4 | Day-5 | Total (A) | Percentage (%=A/G.T*100) |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| | Total | | | | | | (G.T) | |

**Table-2**                **Positions – A2 state**

**Day -1**

| S.No | Positions | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| | Total | | | | | | | | | |

S1 - S8 : Session numbers

**Table-3**                     **Positions – A2 state**

**Day - 2**

| S.No | Positions | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-----------|----|----|----|----|----|----|----|----|-------|
| 1 |  |  |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |  |  |  |
| 6 |  |  |  |  |  |  |  |  |  |  |
| 7 |  |  |  |  |  |  |  |  |  |  |
| 8 |  |  |  |  |  |  |  |  |  |  |
|   |  |  |  |  |  |  |  |  |  |  |
|   | **Total** |  |  |  |  |  |  |  |  |  |

S1 - S8 : Session numbers

**Table-4**                     **Positions – A2 state**

**Day - 3**

| S.No | Positions | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-----------|----|----|----|----|----|----|----|----|-------|
| 1 |  |  |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |  |  |  |
| 6 |  |  |  |  |  |  |  |  |  |  |
| 7 |  |  |  |  |  |  |  |  |  |  |
| 8 |  |  |  |  |  |  |  |  |  |  |
|   |  |  |  |  |  |  |  |  |  |  |
|   | **Total** |  |  |  |  |  |  |  |  |  |

S1 - S8 : Session numbers

**Table-5**              **Positions – A2 state**

**Day - 4**

| S.No | Positions | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-----------|----|----|----|----|----|----|----|----|-------|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| | | | | | | | | | | |
| | **Total** | | | | | | | | | |

S1 - S8 : Session numbers

**Table-6**              **Positions – A2 state**

**Day - 5**

| S.No | Positions | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-----------|----|----|----|----|----|----|----|----|-------|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| | | | | | | | | | | |
| | **Total** | | | | | | | | | |

S1 - S8 : Session numbers

**Table-7**                    **Positions – A2 state**

| S. No | Positions | Day-1 | Day-2 | Day-3 | Day-4 | Day-5 | Total |
|---|---|---|---|---|---|---|---|
| 1 | | | | | | | |
| 2 | | | | | | | |
| 3 | | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |
| 8 | | | | | | | |
| | | | | | | | |
| | **Total** | | | | | | |

S1 - S8 : Session numbers

**Table-8**                    **Positions – A2 state**

**Day - 1**

| S.No | Positions | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| | | | | | | | | | | |
| | **Total** | | | | | | | | | |

S1 - S8 : Session numbers

**Table-9**          **Positions – All states**

**Day - 2**

| S.No | Positions | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-----------|----|----|----|----|----|----|----|----|-------|
| 1 |  |  |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |  |  |  |
| 6 |  |  |  |  |  |  |  |  |  |  |
| 7 |  |  |  |  |  |  |  |  |  |  |
| 8 |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  | **Total** |  |  |  |  |  |  |  |  |  |

S1 - S8 : Session numbers

**Table-10**          **Positions – All states**

**Day - 3**

| S.No | Positions | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-----------|----|----|----|----|----|----|----|----|-------|
| 1 |  |  |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |  |  |  |
| 6 |  |  |  |  |  |  |  |  |  |  |
| 7 |  |  |  |  |  |  |  |  |  |  |
| 8 |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  | **Total** |  |  |  |  |  |  |  |  |  |

S1 - S8 : Session numbers

48

**Table-11**  **Positions – All states**

**Day - 4**

| S.No | Positions | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-----------|----|----|----|----|----|----|----|----|-------|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| | | | | | | | | | | |
| | **Total** | | | | | | | | | |

S1 - S8 : Session numbers

**Table-12**  **Positions – All states**

**Day - 5**

| S.No | Positions | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-----------|----|----|----|----|----|----|----|----|-------|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| | | | | | | | | | | |
| | **Total** | | | | | | | | | |

S1 - S8 : Session numbers

49

**Table-13**　　　　　　　　**Positions – All states**

| S. No | Positions | Day-1 | Day-2 | Day-3 | Day-4 | Day-5 | Total |
|-------|-----------|-------|-------|-------|-------|-------|-------|
| 1 | | | | | | | |
| 2 | | | | | | | |
| 3 | | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |
| 8 | | | | | | | |
| | | | | | | | |
| | **Total** | | | | | | |

S1 - S8 : Session numbers

**Table-14**　　　　　　　　**Positions – A2 state**

| S. No | Positions | A2 state Totals (A) | Total (B) | Percentage %=(A/B)*100 |
|-------|-----------|---------------------|-----------|------------------------|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |

**Table-15**

**Materials – A2 state**

**Day - 1**

| S.No | Materials | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-----------|----|----|----|----|----|----|----|----|-------|
| 1 |  |  |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |  |  |  |
| 6 |  |  |  |  |  |  |  |  |  |  |
| 7 |  |  |  |  |  |  |  |  |  |  |
| 8 |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  | **Total** |  |  |  |  |  |  |  |  |  |

S1 - S8 : Session numbers

**Table-16**

**Materials – A2 state**

**Day - 2**

| S.No | Materials | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-----------|----|----|----|----|----|----|----|----|-------|
| 1 |  |  |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |  |  |  |
| 6 |  |  |  |  |  |  |  |  |  |  |
| 7 |  |  |  |  |  |  |  |  |  |  |
| 8 |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  | **Total** |  |  |  |  |  |  |  |  |  |

S1 - S8 : Session numbers

**Table-17**　　　　　　　　　**Materials – A2 state**

**Day - 3**

| S.No | Materials | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-----------|----|----|----|----|----|----|----|----|-------|
| 1 |  |  |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |  |  |  |
| 6 |  |  |  |  |  |  |  |  |  |  |
| 7 |  |  |  |  |  |  |  |  |  |  |
| 8 |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  | **Total** |  |  |  |  |  |  |  |  |  |

S1 - S8 : Session numbers

**Table-18**　　　　　　　　　**Materials – A2 state**

**Day - 4**

| S.No | Materials | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-----------|----|----|----|----|----|----|----|----|-------|
| 1 |  |  |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |  |  |  |
| 6 |  |  |  |  |  |  |  |  |  |  |
| 7 |  |  |  |  |  |  |  |  |  |  |
| 8 |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  | **Total** |  |  |  |  |  |  |  |  |  |

S1 - S8 : Session numbers

**Table-19**  **Materials – A2 state**

**Day - 5**

| S.No | Materials | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-----------|----|----|----|----|----|----|----|----|-------|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| | | | | | | | | | | |
| | **Total** | | | | | | | | | |

S1 - S8 : Session numbers

**Table-20**  **Materials – A2 state**

| S. No | Materials | Day-1 | Day-2 | Day-3 | Day-4 | Day-5 | Total |
|-------|-----------|-------|-------|-------|-------|-------|-------|
| 1 | | | | | | | |
| 2 | | | | | | | |
| 3 | | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |
| 8 | | | | | | | |
| | | | | | | | |
| | **Total** | | | | | | |

S1 - S8 : Session numbers

**Table-21**              **Materials – All states**

## Day - 1

| S.No | Materials | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-----------|----|----|----|----|----|----|----|----|-------|
| 1 |  |  |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |  |  |  |
| 6 |  |  |  |  |  |  |  |  |  |  |
| 7 |  |  |  |  |  |  |  |  |  |  |
| 8 |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  | Total |  |  |  |  |  |  |  |  |  |

S1 - S8 : Session numbers

**Table-22**              **Materials – All states**

## Day - 2

| S.No | Materials | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-----------|----|----|----|----|----|----|----|----|-------|
| 1 |  |  |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |  |  |  |
| 6 |  |  |  |  |  |  |  |  |  |  |
| 7 |  |  |  |  |  |  |  |  |  |  |
| 8 |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  | Total |  |  |  |  |  |  |  |  |  |

S1 - S8 : Session numbers

**Table-23**                  **Materials – All states**

### Day - 3

| S.No | Materials | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-----------|----|----|----|----|----|----|----|----|-------|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| | | | | | | | | | | |
| | **Total** | | | | | | | | | |

S1 - S8 : Session numbers

**Table-24**                  **Materials – All states**

### Day - 4

| S.No | Materials | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-----------|----|----|----|----|----|----|----|----|-------|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| | | | | | | | | | | |
| | **Total** | | | | | | | | | |

S1 - S8 : Session numbers

**Table-25**          **Materials – All states**

**Day - 5**

| S.No | Materials | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-----------|----|----|----|----|----|----|----|----|-------|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| | | | | | | | | | | |
| | **Total** | | | | | | | | | |

S1 - S8 : Session numbers

**Table-26**          **Materials – All states**

| S. No | Materials | Day-1 | Day-2 | Day-3 | Day-4 | Day-5 | Total |
|-------|-----------|-------|-------|-------|-------|-------|-------|
| 1 | | | | | | | |
| 2 | | | | | | | |
| 3 | | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |
| 8 | | | | | | | |
| | | | | | | | |
| | **Total** | | | | | | |

56

**Table-27**                    **Materials – A2 state**

| S. No | Materials | A2 state Totals (A) | Total (B) | Percentage %=(A/B)*100 |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| | | | | |
| | | | | |

**Table-28**                    **Activities – A2 state**

**Day - 1**

| S.No | Activities | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | **Total** | | | | | | | | | |

S1 - S8 : Session numbers

57

**Table-29**　　　　　　　　**Activities – A2 state**

**Day - 2**

| S.No | Activities | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-----------|----|----|----|----|----|----|----|----|-------|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | **Total** | | | | | | | | | |

S1 - S8 : Session numbers

**Table-30**　　　　　　　　**Activities – A2 state**

**Day - 3**

| S.No | Activities | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-----------|----|----|----|----|----|----|----|----|-------|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | **Total** | | | | | | | | | |

S1 - S8 : Session numbers

58

**Table-31**  **Activities – A2 state**

**Day - 4**

| S.No | Activities | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | **Total** | | | | | | | | | |

S1 - S8 : Session numbers

**Table-32**  **Activities – A2 state**

**Day - 5**

| S.No | Activities | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | **Total** | | | | | | | | | |

S1 - S8 : Session numbers

## Table-33                     Activities – A2 state

| S. No | Activities | Day-1 | Day-2 | Day-3 | Day-4 | Day-5 | Total |
|---|---|---|---|---|---|---|---|
| 1 | | | | | | | |
| 2 | | | | | | | |
| 3 | | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | Total | | | | | | |

## Table-34                     Activities – All states
### Day - 1

| S.No | Activities | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | Total | | | | | | | | | |

S1 - S8 : Session numbers

**Table-35**  **Activities – All states**

**Day - 2**

| S.No | Activities | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-----------|----|----|----|----|----|----|----|----|-------|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | **Total** | | | | | | | | | |

S1 - S8 : Session numbers

**Table-36**  **Activities – All states**

**Day - 3**

| S.No | Activities | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-----------|----|----|----|----|----|----|----|----|-------|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | **Total** | | | | | | | | | |

S1 - S8 : Session numbers

61

**Table-37**          **Activities – All states**

## Day - 4

| S.No | Activities | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-----------|----|----|----|----|----|----|----|----|-------|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | **Total** | | | | | | | | | |

S1 - S8 : Session numbers

**Table-38**          **Activities – All states**

## Day - 5

| S.No | Activities | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-----------|----|----|----|----|----|----|----|----|-------|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | **Total** | | | | | | | | | |

S1 - S8 : Session numbers

**Table-39**  **Activities – All states**

| S. No | Activities | Day-1 | Day-2 | Day-3 | Day-4 | Day-5 | Total |
|-------|-----------|-------|-------|-------|-------|-------|-------|
| 1 | | | | | | | |
| 2 | | | | | | | |
| 3 | | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | **Total** | | | | | | |

**Table-40**  **Activities – A2 state**

| S. No | Activities | A2 state Totals (A) | Total (B) | Percentage %=(A/B)*100 |
|-------|-----------|---------------------|-----------|------------------------|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| | | | | |
| | | | | |
| | | | | |

**Table-41**                    **Interaction – A2 state**

**Day - 1**

| S.No | Interaction | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-------------|----|----|----|----|----|----|----|----|-------|
| 1 | Attending | | | | | | | | | |
| 2 | Engaging | | | | | | | | | |
| | Total | | | | | | | | | |

**Table-42**                    **Interaction – A2 state**

**Day - 2**

| S.No | Interaction | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-------------|----|----|----|----|----|----|----|----|-------|
| 1 | Attending | | | | | | | | | |
| 2 | Engaging | | | | | | | | | |
| | Total | | | | | | | | | |

**Table-43**                    **Interaction – A2 state**

**Day - 3**

| S.No | Interaction | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-------------|----|----|----|----|----|----|----|----|-------|
| 1 | Attending | | | | | | | | | |
| 2 | Engaging | | | | | | | | | |
| | Total | | | | | | | | | |

**Table-44**                    **Interaction – A2 state**

**Day - 4**

| S.No | Interaction | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-------------|----|----|----|----|----|----|----|----|-------|
| 1 | Attending | | | | | | | | | |
| 2 | Engaging | | | | | | | | | |
| | Total | | | | | | | | | |

**Table-45**   Interaction – A2 state

**Day - 5**

| S.No | Interaction | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-------------|----|----|----|----|----|----|----|----|-------|
| 1 | Attending | | | | | | | | | |
| 2 | Engaging | | | | | | | | | |
| | Total | | | | | | | | | |

**Table-46**   Interaction – A2 state

| S. No | Interaction | Day-1 | Day-2 | Day-3 | Day-4 | Day-5 | Total |
|-------|-------------|-------|-------|-------|-------|-------|-------|
| 1 | Attending | | | | | | |
| 2 | Engaging | | | | | | |
| | Total | | | | | | |

**Table-47**   Interaction – All states

**Day - 1**

| S.No | Interaction | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-------------|----|----|----|----|----|----|----|----|-------|
| 1 | Attending | | | | | | | | | |
| 2 | Engaging | | | | | | | | | |
| | Total | | | | | | | | | |

65

**Table-48**                    **Interaction – All states**

**Day - 2**

| S.No | Interaction | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-------------|----|----|----|----|----|----|----|----|-------|
| 1 | Attending | | | | | | | | | |
| 2 | Engaging | | | | | | | | | |
| | Total | | | | | | | | | |


**Table-49**                    **Interaction – All states**

**Day - 3**

| S.No | Interaction | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-------------|----|----|----|----|----|----|----|----|-------|
| 1 | Attending | | | | | | | | | |
| 2 | Engaging | | | | | | | | | |
| | Total | | | | | | | | | |


**Table-50**                    **Interaction – All states**

**Day - 4**

| S.No | Interaction | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-------------|----|----|----|----|----|----|----|----|-------|
| 1 | Attending | | | | | | | | | |
| 2 | Engaging | | | | | | | | | |
| | Total | | | | | | | | | |

**Table-51**           **Interaction – All states**

## Day - 5

| S.No | Interaction | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | Total |
|------|-------------|----|----|----|----|----|----|----|----|-------|
| 1 | Attending | | | | | | | | | |
| 2 | Engaging | | | | | | | | | |
| | Total | | | | | | | | | |

**Table-52**           **Interaction – All states**

| S. No | Interaction | Day-1 | Day-2 | Day-3 | Day-4 | Day-5 | Total |
|-------|-------------|-------|-------|-------|-------|-------|-------|
| 1 | Attending | | | | | | |
| 2 | Engaging | | | | | | |
| | Total | | | | | | |

**Table-53**           **Interaction – A2 state**

| S. No | Interaction | A2 state Totals (A) | Total (B) | Percentage %=(A/B)*100 |
|-------|-------------|---------------------|-----------|------------------------|
| 1 | Attending | | | |
| 2 | Engaging | | | |
| | Total | | | |

# Analysis and Interpretation of Bio-Behaviour States

**Case ID** :

**Name** :

**Age/sex** :

**Reg.No** :

1. Which part of the day she/he is active?

2. In which position she/he is active?

3. With what material she/he is active?

4. In which activity she/he is more active?

5. Which type of interaction (person) she/he is active?