1. Capstone Project: SPSS Analysis

Project Title:

Does the type of background lighting affect reading speed?

Objective:

To find out if different lighting environments (Natural Light, White LED, or Dim Light) impact how quickly people can read a passage (measured in seconds).

What Kind of Data Is This?

Variable Name	Type	Description
Lighting_Type	Categorical	Type of lighting used while reading
Reading_Time	Numeric	Time taken to read a fixed passage (in seconds)

Step 1: Prepare Your Data

Use this sample data for simplicity:

Person_ID	Lighting_Type	Reading_Time
1	Natural Light	120
2	Natural Light	125
3	Natural Light	118
4	White LED	135
5	White LED	132
6	White LED	137
7	Dim Light	145
8	Dim Light	150

9	DimLight	148

Step 2: Open SPSS and Create Variables

1. Open SPSS → Click **Variable View**
2. Create two variables:
    - **Lighting_Type** → Type: String
    - **Reading_Time** → Type: Numeric

Step 3: Enter the Data

Click **Data View**, and input the data line by line as shown in Step 1.

Step 4: Analyze the Data Using One-Way ANOVA

1. Go to **Analyze** → **Compare Means** → **One-Way ANOVA**
2. Move **Reading_Time** to **Dependent List**
3. Move **Lighting_Type** to **Factor**
4. Click **OK**

Step 5: Interpret the Output

You'll get two important tables:

1. Descriptives Table (Sample Output)

Lighting_Type	Mean Reading_Time
NaturalLight	121 secs
WhiteLED	134.6 secs
DimLight	147.6 secs

2. ANOVA Table

If **Sig. value** < **0.05**, the result is significant. For example:

Sig. = 0.004 → Since 0.004 < 0.05 → **Yes, lighting affects reading speed**

Final Conclusion:

- **NaturalLight** allows fastest reading
- **DimLight** slows reading the most
- **WhiteLED** is in between
- Result is statistically significant → **Lighting type impacts reading performance**

Bonus Step: Bar Chart Visualization

1. Click **Graphs** → **Chart Builder**
2. Select **Bar Chart**

3. Drag Lighting_Type to x-axis and Reading_Time to y-axis
4. Click OK to generate chart

Shorter bars = faster reading time.

2. Capstone Project: SPSS Analysis

Project Title:

Does noise level affect a person's concentration?

Objective:

To examine whether different levels of background noise (Quiet, Moderate, Loud) influence how well a person concentrates, measured through a standardized concentration test score.

What Kind of Data Is This?

Variable Name	Type	Description
Noise_Level	Categorical	Environment condition: Quiet, Moderate, or Loud
Concentration_Score	Numeric	Score on a concentration test (out of 100)

Step 1: Prepare Your Data

Use this sample data:

Person_ID	Noise_Level	Concentration_Score
1	Quiet	88
2	Quiet	85
3	Quiet	90
4	Moderate	78
5	Moderate	74

6	Moderate	76
7	Loud	65
8	Loud	68
9	Loud	62

Step 2: Create Variables in SPSS

1. Open SPSS → Click on **Variable View**
2. Create:
    - Noise_Level → **Type: String**
    - Concentration_Score → **Type: Numeric**

Step 3: Enter the Data

Switch to **Data View** and enter the values row by row as shown in Step 1.

Step 4: Run One-Way ANOVA

1. Click **Analyze → Compare Means → One-Way ANOVA**
2. Move Concentration_Score to **Dependent List**
3. Move Noise_Level to **Factor**
4. Click **OK**

Step 5: Interpret the Output

1. Descriptive Statistics Table (Example)

Noise_Level	Mean Concentration_Score
Quiet	87.6
Moderate	76.0
Loud	65.0

2. ANOVA Table

If the **Sig. (p-value) < 0.05**, the result is **significant**.

Example:

Sig. = 0.002 → Since 0.002 < 0.05 → Yes, **noise level affects concentration**

Conclusion:

- **Quiet environments** lead to the highest concentration scores

- **Loud environments** result in the lowest scores
- The **difference is statistically significant**, suggesting background noise affects focus levels

Bonus Step: Visual Bar Chart

1. Go to **Graphs → Chart Builder**
2. Drag in a **Bar Chart**
3. Set Noise_Level on the x-axis, Concentration_Score on the y-axis
4. Click **OK**

Visual insight: Higher bars = better concentration.

3. Capstone Project: SPSS Analysis

Project Title:

Do more breaks really boost productivity?

Objective:

To examine if the number of breaks a person takes during a 4-hour work session affects their productivity, measured as a score out of 100.

Variables Overview

Variable Name	Type	Description
Breaks_Count	Categorical	Frequency of breaks: No Break, 1– 2 Breaks, 3+ Breaks
Productivity_Score	Numeric	Productivity output score (based on tasks completed, accuracy, and pace)

Step 1: Sample Dataset

Person_ID	Breaks_Count	Productivity_Score
1	No Break	60
2	No Break	58
3	No Break	62
4	1– 2 Breaks	75

5	1–2 Breaks	78
6	1–2 Breaks	72
7	3+ Breaks	65
8	3+ Breaks	66
9	3+ Breaks	63

Step 2: Variable Setup in SPSS

1. Open SPSS → Go to **Variable View**
2. Add:
    - Breaks_Count → Type: **String**
    - Productivity_Score → Type: **Numeric**

Step 3: Enter the Data

In **Data View**, type the sample data row by row as above.

Step 4: Perform One-Way ANOVA

1. Click **Analyze** → **Compare Means** → **One-Way ANOVA**
2. Move **Productivity_Score** to **Dependent List**
3. Move **Breaks_Count** to **Factor**
4. Click **OK**

Step 5: Interpret Your Results

Descriptive Stats (Example Output):

Breaks_Count **Mean Productivity_Score**

No Break 60.0

1–2 Breaks 75.0

3+ Breaks 64.6

ANOVA Significance Test:

- If **Sig.** < **0.05**, the difference is statistically meaningful.
  Example:
  Sig. = 0.01 → Significant → Break pattern affects productivity.

Conclusion:

- People who took **1–2 breaks** had the **highest productivity**
- No breaks and too many breaks (3+) both **lowered** performance
- A balanced break schedule seems ideal
- Result is statistically significant → Break frequency does affect output

Optional: Visual Representation

1. Click **Graphs → Chart Builder**
2. Select a **Bar Chart**
3. X-Axis: Breaks_Count
4. Y-Axis: Productivity_Score
5. Generate the chart

4. Capstone Project: SPSS Analysis

Project Title:

Does caffeine boost attention span?

Objective:

To evaluate whether different levels of caffeine consumption influence a person's ability to maintain attention during a 30-minute cognitive task.

Variables Summary

Variable Name	Type	Description
Caffeine_Intake	Categorical	Caffeine level: None, Low (1 cup), High (3+ cups)
Attention_Span	Numeric	Score from an attention span test (out of 100)

Step 1: Hypothetical Sample Data

Person_ID	Caffeine_Intake	Attention_Span
1	None	64
2	None	67
3	None	62
4	Low	76
5	Low	79
6	Low	75

7	High	70
8	High	68
9	High	72

Step 2: Set Up in SPSS

In **Variable View**, define:

- Caffeine_Intake → **String**
- Attention_Span → **Numeric**

Then, enter data in **Data View** as shown above.

Step 3: Run a One-Way ANOVA

1. Go to **Analyze → Compare Means → One-Way ANOVA**
2. Move Attention_Span → **Dependent List**
3. Move Caffeine_Intake → **Factor**
4. Click **OK**

Step 4: Interpret the Output

Example Descriptive Statistics:

Caffeine_Intake	Mean Attention_Span
None	64.3
Low	76.6
High	70.0

ANOVA Results:

- **Sig. = 0.015** → This is less than 0.05 → **Statistically significant**

Conclusion:

- **Low caffeine intake** (around 1 cup) appears to **enhance attention span**
- **No caffeine** yields the lowest scores
- **High caffeine** doesn't give additional benefit and might slightly reduce performance
- The difference is statistically significant → **Caffeine affects attention, but more isn't always better**

Visualization Idea:

Create a **bar chart** to show average attention span by caffeine level.

1. **Graphs → Chart Builder**

2. Choose **Bar Chart**
3. X-axis: Caffeine_Intake, Y-axis: Attention_Span
4. Click **OK**

Bonus Ideas:

- Add a line graph to track **attention over time** post-caffeine
- Explore interaction effects: **Sleep hours + Caffeine intake vs Attention**