Madan Bhandari Memorial College

Sampling Distribution and Estimation

Lab: 1 **Date: 2080/02/29**

PROJECT 1.1: FOR UNGROUPED DATA

OBJECT:

ENTER THE FOLLOWING VALUES IN SPSS AND CALCULATE MEAN, S.D, RANGES, MODE, MEDIAN

WEIGHTS: 25, 35, 45, 55, 65, 75

WORKING EXPRESSIONS:

We have,

i. Mean (X) = $\frac{\sum x}{n}$

ii. Median (Md) = $\frac{n+1}{2}$

iii. Standard Deviation (S.D.) = $\sqrt{\frac{\sum(X-X)2}{n}}$

iv. Range = max – min

v. Mode = maximum repetition of data

vi. Standard error (S.E.) = $\frac{S.D.}{\sqrt{n}}$

Note: Where $\sum x$ represents the sum of all the items in the dataset and n represent the number of items in the given dataset.

PROCESS:

Solution:

1. Select **Analyze** ⟹ **Descriptive statistics** ⟹ **Descriptive**
2. Click the **Descriptive** ⟹ Move **Midvalue** into **Variables(s).**
3. Click the **Option**. Select **Mean, s.d., ranges, mode, median**
4. Click **Ok**

From SPSS,

MEAN, S.D, RANGES, MODE, MEDIAN FROM THE GIVEN DATA IS SHOWN THROUGH THE TABLE

Statistics

Weights

N	Valid	6
	Missing	0
Mean		49.83
Std. Error of Mean		7.705
Median		50.00
Mode		25[a]
Std. Deviation		18.872
Variance		356.167
Range		50
Minimum		25
Maximum		75

RESULT:

From the above table, the following results were obtained:

I. Average of the given data (Mean) = 49.83

II. Median = 50.00

III. Standard Deviation (S.D.)= 18.872

IV. Range of a weight = 50

V. Mode = 25 (Multiple modes exists. The smallest value is shown)

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PROJECT 1.2: FOR UNGROUPED DATA

OBJECT:

ENTER THE FOLLOWING VALUES IN SPSS AND CALCULATE MEAN, S.D, RANGES, MODE, MEDIAN

WEIGHT	MID VALUE	FREQUENCY
20-30	25	4
30-40	35	6
40-50	45	7
50-60	55	21
60-70	65	23
70-80	75	2

WORKING EXPRESSIONS:

We have,

i. Mean (X) = $\frac{\sum x}{n}$

ii. Median (Md) = $\frac{n+1}{2}$

iii. Standard Deviation (S.D.) = $\sqrt{\frac{\sum(X-X)2}{n}}$

iv. Range = max – min

v. Mode = maximum repetition of data

vi. Standard error (S.E.) = $\frac{S.D.}{\sqrt{n}}$

Note: Where $\sum x$ represents the sum of all the items in the dataset and n represent the number of items in the given dataset.

PROCESS:

Solution:

1. Enter the **Data Editor Window**.

2. Select **Data** ⟹ **Weight Cases.**
3. Move **Frequency** into **Frequency Variable**
4. Click **Ok.** Select **Analyze** ⟹ **Descriptive statistic**⟹ **Frequencies**
5. Click the **frequencies** ⟹ Move **MidValue** into **Variable(s)**
6. Click the **Statistics.** Select **Mean.**
7. Click **Continue.** Click **Ok.**

From SPSS,

Statistics

Mid_value

N	Valid	63
	Missing	0
Mean		54.37
Median		55.00
Mode		65
Std. Deviation		12.556
Range		50

RESULT:

From the SPSS output table, the following results are obtained:

i. Mean = 54.37
ii. Median = 55.00
iii. Mode = 65
iv. Standard Deviation (S.D) = 12.556
v. Range = 50

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PROJECT 1.3: ENTER THE FOLLOWING DATA IN SPSS

OBJECT: GIVEN DATA IS:

WEIGHT	MID VALUE	FREQUENCY
20-30	25	4
30-40	35	6
40-50	45	7
50-60	55	21
60-70	65	23
70-80	75	2

WORKING EXPRESSIONS:

We have,

i. Mean (X) = $\frac{\sum x}{n}$

ii. Median (Md) = $\frac{n+1}{2}$

iii. Standard Deviation (S.D.) = $\sqrt{\frac{\sum(X-\bar{X})2}{n}}$

iv. Range = max – min

v. Mode = maximum repetition of data

vi. Standard error (S.E.) = $\frac{S.D.}{\sqrt{n}}$

Note: Where $\sum x$ represents the sum of all the items in the dataset and n represent the number of items in the given dataset.

PROCESS:

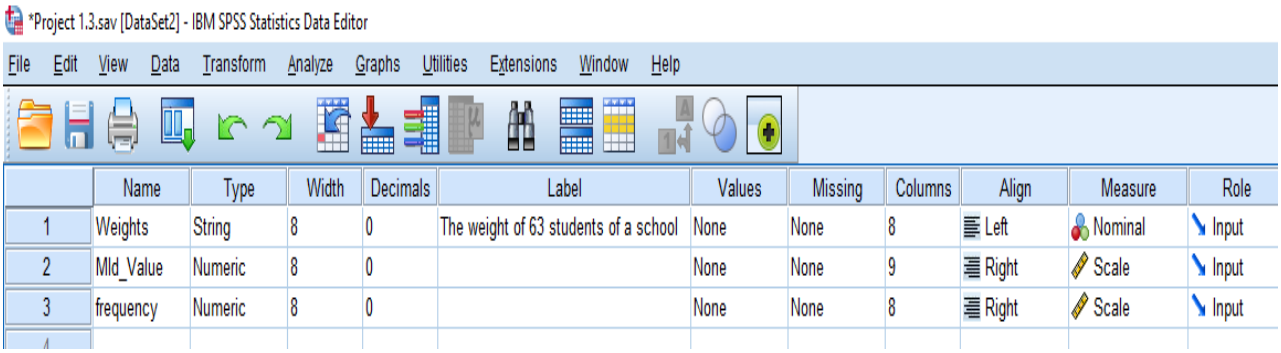
In this task, we will create four types of variables: Numeric, data, string and binary.

1. Click the **Type in data tab.**
2. Click the **Variable View** tab at the bottom of the window.

3. With the cursor in the Name column on the first row type: **Weight,** on the second row type: **Midvalue,** on the third row type: **Frequency.**
4. In the Type column, click the **Numeric** to open the Variable Type dialog box.
5. Select (Click) **String.**
6. Click **Ok.**
7. Press tab or Enter three times to move to **label column.**
8. Type "The weight of 63 students of a school".
9. Click the **Data View** tab at the bottom of the window.
10. Enter the values as follows. Then save file.

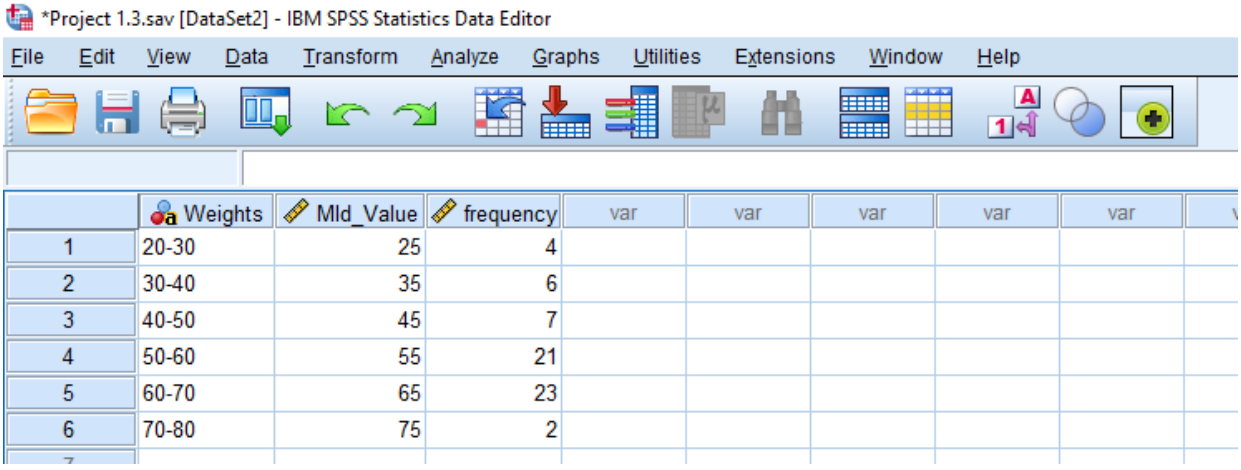
After following above process, following results were seen:

Variable View:



	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	Weights	String	8	0	The weight of 63 students of a school	None	None	8	Left	Nominal	Input
2	Mld_Value	Numeric	8	0		None	None	9	Right	Scale	Input
3	frequency	Numeric	8	0		None	None	8	Right	Scale	Input

Data View:



	Weights	Mld_Value	frequency	var	var	var	var	var
1	20-30	25	4					
2	30-40	35	6					
3	40-50	45	7					
4	50-60	55	21					
5	60-70	65	23					
6	70-80	75	2					

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PROJECT 1.4: CONFIDENCE INTERVAL FOR POPULATION MEAN μ, (σ UNKNOWN AND LARGE n)

OBJECT:

ENTER THE FOLLOWING VALUES IN SPSS AND CREAT A CONFIDENCE INTERVAL ASSUMING NORMAL DISTRUBUTION

LENGTH: 125, 120, 121, 123, 122, 130, 124, 122, 120, 122, 118, 119, 123, 124, 122, 124, 121, 122, 138, 149, 123, 128, 122. 130. 120, 122, 124, 134, 137, 128, 122, 121, 125, 120, 132, 130, 128, 130, 122, 124

WORKING EXPRESSIONS:

i. Mean (X) = $\frac{\sum x}{n}$

ii. Median (Md) = $\frac{n+1}{2}$

iii. Standard Deviation (S.D.) = $\sqrt{\frac{\sum(X-\bar{X})2}{n}}$

iv. Range = max – min

v. Mode = maximum repetition of data

vi. Standard error (S.E.) = $\frac{S.D.}{\sqrt{n}}$

vii. Confidence Interval (C.I.)= $\bar{X} \pm Z\frac{S.D.}{\sqrt{n}}$

Note: Where $\sum x$ represents the sum of all the items in the dataset and n represent the number of items in the given dataset.

PROCESS:

1. Enter the **data.**
2. Select **Analyze** ⟹ **Compare Means** ⟹ **One sample T test**
3. Click **Options** ⟹ Type % (90, 95, 99)**confidence interval**
4. Click on **Continue** and then Click **Ok.**

From SPSS, the confidence interval after entering the given value in SPSS is:

One-Sample Test

	Test Value = 0					
					95% Confidence Interval of the Difference	
	T	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Length	128.879	39	.000	125.275	123.31	127.24

RESULT:

Using SPSS, the confidence interval of the given data is 125.275, 127.4 at 95% confident level.