

Research & Statistics

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Software

- SAS
- SPSS
- LISREL
- MATLAB
- MINITAB
- Microsoft Excel

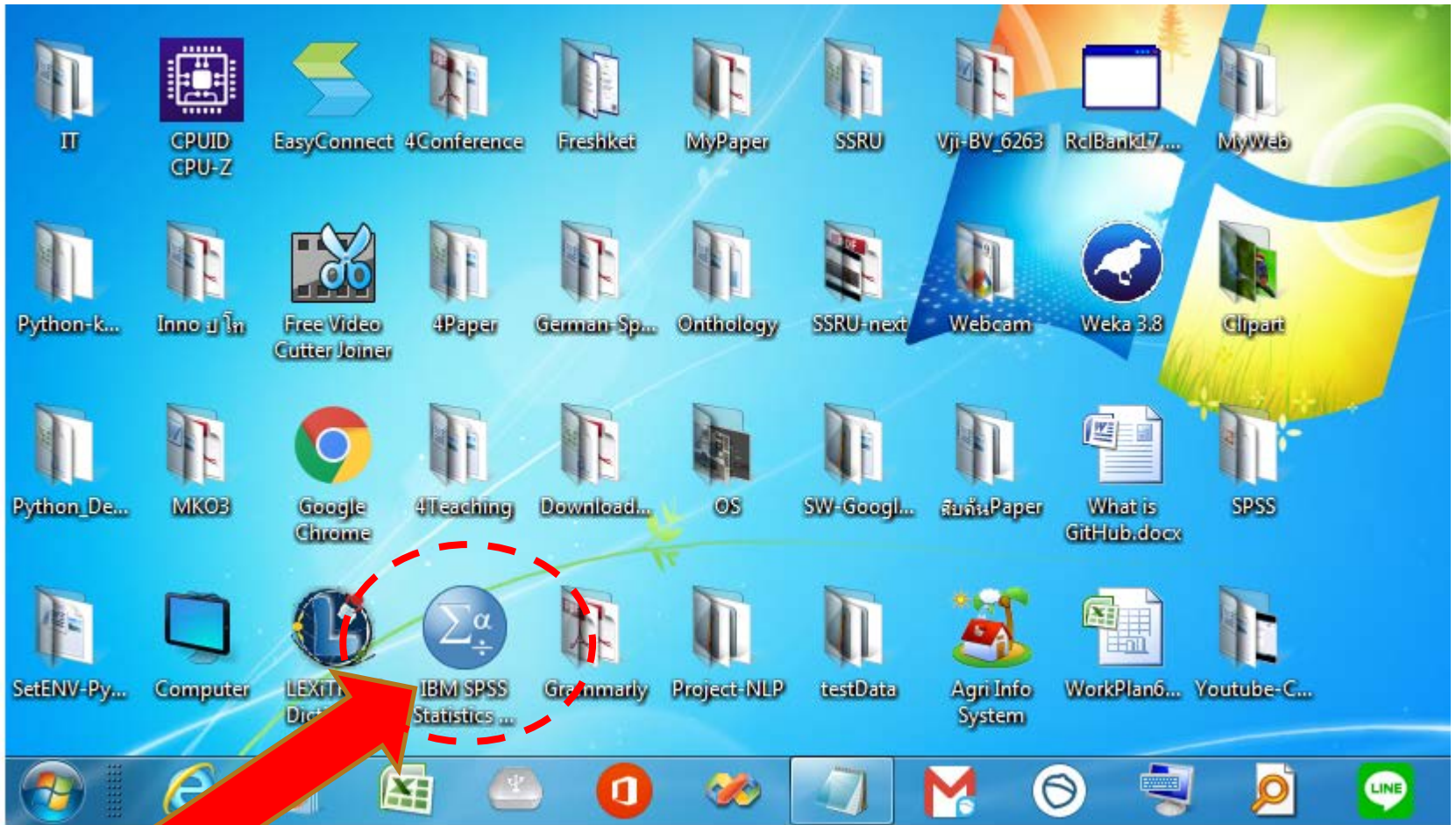
SPSS (IBM SPSS Statistics)

- **Shareware**
- Full version

<https://www.ibm.com/analytics/spss-statistics-software>

Download link

- <https://ibm-spss-statistics-base.th.uptodown.com/windows>
- <https://software.thaiware.com/5569-IBM-SPSS-Statistics.html>
- <https://spss.th.softonic.com/>



Not allowed	Nominal	Ratio	Ordinal	Ratio	Ordinal
↑	↑	↑	↑	↑	↑
Name	gender	Age	Age range	Height	Educational degree
Somchai	male	18	Teen	175.8	Secondary
Peter	male	9	Child	129	Primary
Sara	female	42	Adult	164.5	Master
John	male	50	Adult	173	Doctor
Amnart	male	17	Teen	174	Secondary
Malee	female	21	Adult	168.3	Bachelor
Dumrong	male	62	Senior	169	Bachelor

Nominal

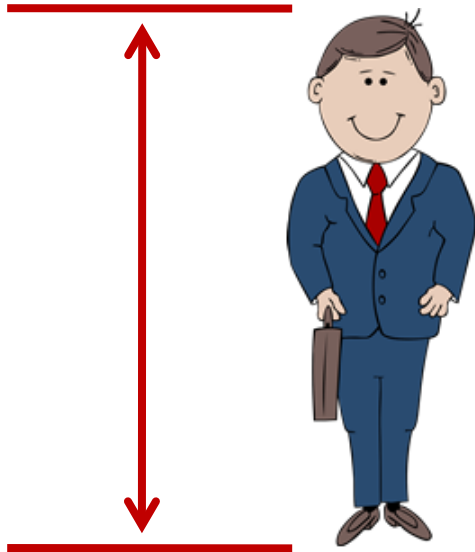
Name	gender
Somchai	male
Peter	male
Sara	female
John	male
Amnart	male
Malee	female
Dumrong	male

Frequency	male 5 female 2
Mode	male

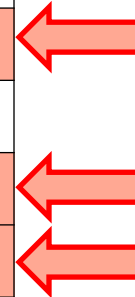
Ordinal

Age range			
Teen	Frequency	Child 1	$(1/7)*100=14.3\%$
Child		Teen 2	$(2/7)*100=28.6\%$
Adult		Adult 3	$(3/7)*100$
Adult		Senior 1	$(1/7)*100$
Teen	Mode	Adult	
Adult	Median	Adult	
Senior			

Interval, Ratio

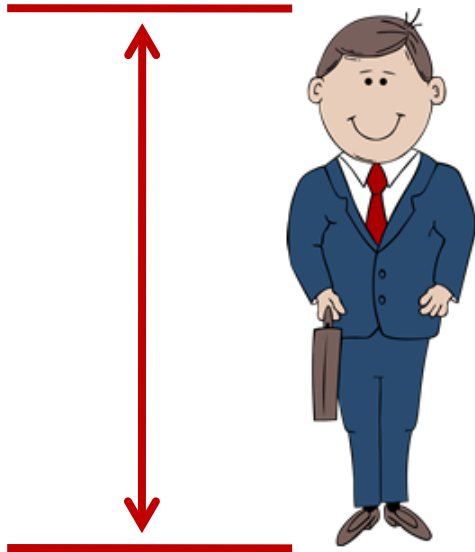


#	Height
1	167
2	162
3	168
4	162
5	162
6	165
7	166
8	166
9	160
10	165



Mode = 162

Interval, Ratio



#	Height
1	167
2	162
3	168
4	162
5	162
6	165
7	166
8	166
9	160
10	165

Sorted
160
162
162
162
162
165
165
166
166
167
168

Median = 165



Range = 160-165

Interval, Ratio

\bar{x}

(*Mean*)

Average μ

$$\mu = \sum_{i=1}^n \frac{x_i}{n}$$

S.D.

(*Standard Deviation*)

$$S.D. = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n-1}}$$

Interval, Ratio

\bar{x}

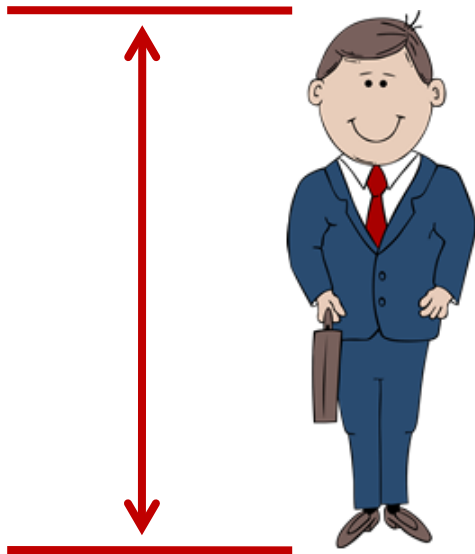
S.D.

(Mean)

(Standard Deviation)

1 3 5	→	3	→	2
2 3 4	→	3	→	1
3 3 3	→	3	→	0

Interval, Ratio



#	Height
1	167
2	162
3	168
4	162
5	162
6	165
7	166
8	166
9	160
10	165

Mean

$$\mu = \sum_{i=1}^n \frac{x_i}{n}$$

$$\mu = \frac{167 + 162 + \dots + 165}{10}$$

$$\mu = \frac{1643}{10} = 164.3$$

Interval, Ratio

(**Standard Deviation**)

#	Height
1	167
2	162
3	168
4	162
5	162
6	165
7	166
8	166
9	160
10	165

$$S.D. = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n-1}}$$

$$S.D. = \sqrt{\frac{(167 - 164.3)^2 + (162 - 164.3)^2 + \dots + (165 - 164.3)^2}{10 - 1}}$$

$$S.D. = \sqrt{\frac{62.1}{9}} = 2.62679$$

SPSS

1. Define variables

slide1-testData.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	Sex	String	1	0	เพศ	None	None	8	Left	Nominal	Input
2	Height	Numeric	8	2	ความสูง	None	None	8	Right	Scale	Input
3											
4											
5											
6											
7											
8											
9											

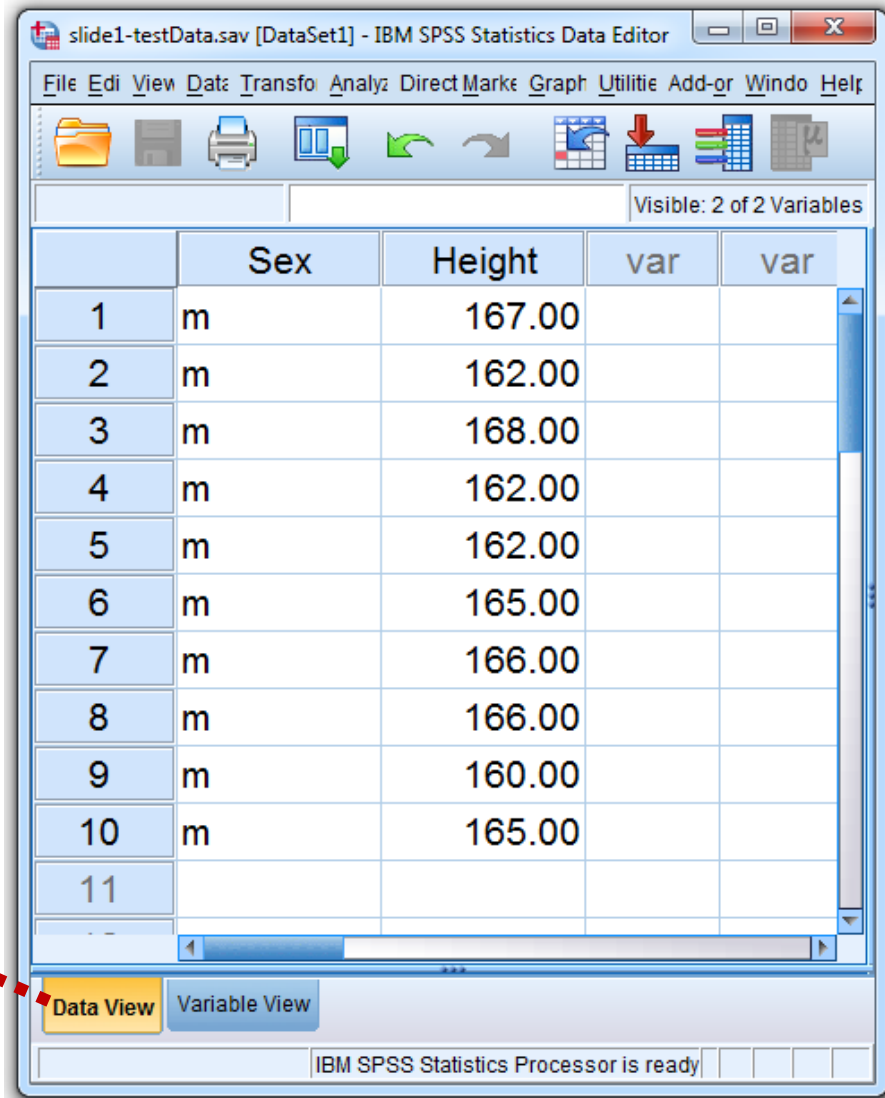
Variable View

Data View Variable View

IBM SPSS Statistics Processor is ready

SPSS

2. Input data



The screenshot shows the IBM SPSS Statistics Data Editor window. The title bar reads "slide1-testData.sav [DataSet1] - IBM SPSS Statistics Data Editor". The menu bar includes File, Edit, View, Data, Transform, Analyze, Direct, Mark, Graph, Utilities, Add-on, Window, and Help. The toolbar contains icons for file operations, editing, and analysis. The main window displays a Data View with 11 rows of data. The columns are labeled "Sex" and "Height". The data is as follows:

	Sex	Height	var	var
1	m	167.00		
2	m	162.00		
3	m	168.00		
4	m	162.00		
5	m	162.00		
6	m	165.00		
7	m	166.00		
8	m	166.00		
9	m	160.00		
10	m	165.00		
11				

At the bottom of the window, there are two tabs: "Data View" (which is selected and highlighted in yellow) and "Variable View". The status bar at the bottom right indicates "IBM SPSS Statistics Processor is ready".

Data View

SPSS

3. Analyze data

1. Analyze > Descriptive Statistics > Frequencies

2. Select data

3. Choose Statistics

4. Click Continue

5. Click OK

The image shows a screenshot of the IBM SPSS Statistics interface. On the left, a data view window displays a table with columns 'Sex' and 'Height'. The 'Height' column contains values: 167.0, 162.0, 168.0, 162.0, 162.0, 165.00, 166.00, 166.00, 160.00, 165.00. The 'Frequencies' dialog box is open, with 'ความสูง [Height]' selected in the 'Variable(s):' list. The 'Frequencies: Statistics' sub-dialog box is also open, showing the 'Central Tendency' section with 'Mean', 'Median', and 'Mode' checked. The 'Continue' button in the 'Frequencies: Statistics' dialog is highlighted with a red arrow labeled '4.', and the 'OK' button in the 'Frequencies' dialog is highlighted with a red arrow labeled '5.'. Red dashed circles and arrows indicate the sequence of steps: 2. (selecting the variable), 3. (choosing statistics), 4. (clicking Continue), and 5. (clicking OK).

Sex	Height
1	167.0
2	162.0
3	168.0
4	162.0
5	162.0
6	165.00
7	166.00
8	166.00
9	160.00
10	165.00
11	

SPSS

Results

```
FREQUENCIES VARIABLES=Height  
  /STATISTICS=STDDEV MEAN MEDIAN MODE  
  /ORDER=ANALYSIS.
```

→ Frequencies

[DataSet1] C:\Users\Administrator\Documents\slide1-testData.sav

Statistics

ความสูง

N	Valid	10
	Missing	0
Mean		164.3000
Median		165.0000
Mode		162.00
Std. Deviation		2.62679

ความสูง

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	160.00	1	10.0	10.0	10.0
	162.00	3	30.0	30.0	40.0
	165.00	2	20.0	20.0	60.0
	166.00	2	20.0	20.0	80.0
	167.00	1	10.0	10.0	90.0
	168.00	1	10.0	10.0	100.0
	Total	10	100.0	100.0	