Research & Statistics

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Software

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

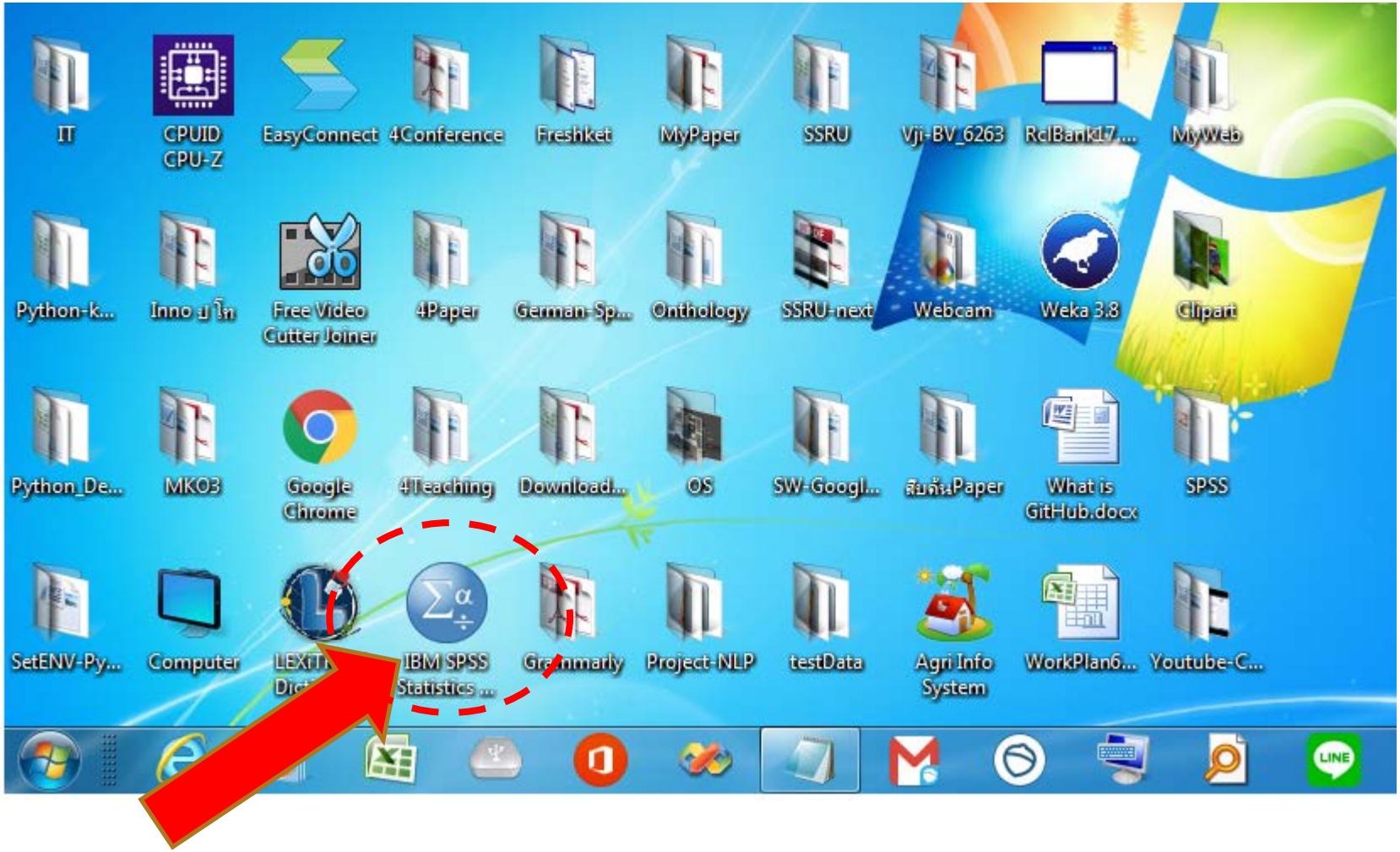
SPSS (IBM SPSS Statistics)

- **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/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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

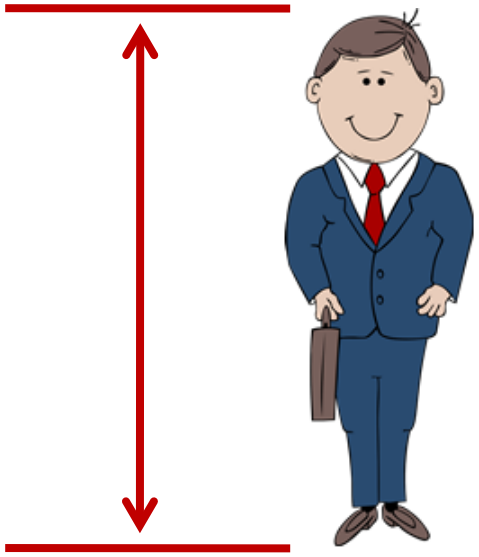
Frequency	male 5 female 2
Mode	male

Ordinal

Age range
Teen
Child
Adult
Adult
Teen
Adult
Senior

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

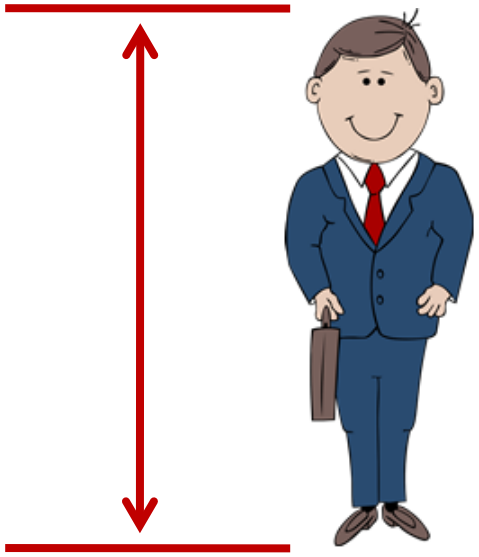
Interval, Ratio



#	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
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.

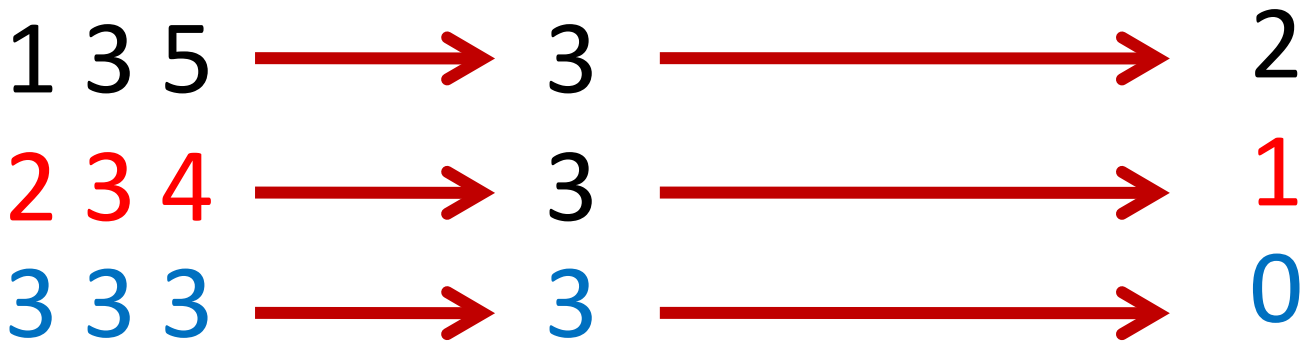
(***Standard Deviation***)

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

Interval, Ratio

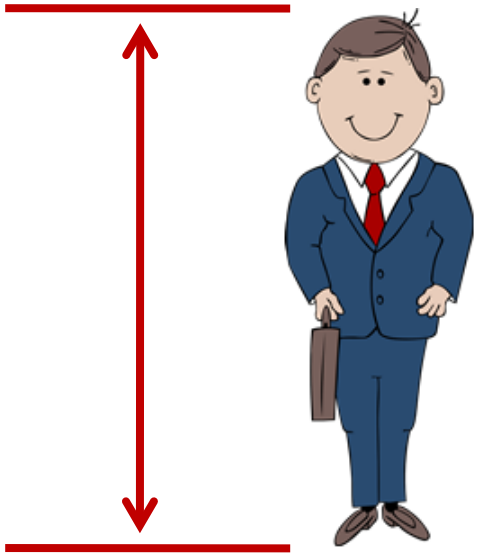
$\bar{x}$ **S.D.**

(***Mean***) (***Standard Deviation***)



Interval, Ratio

Mean



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

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

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

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

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

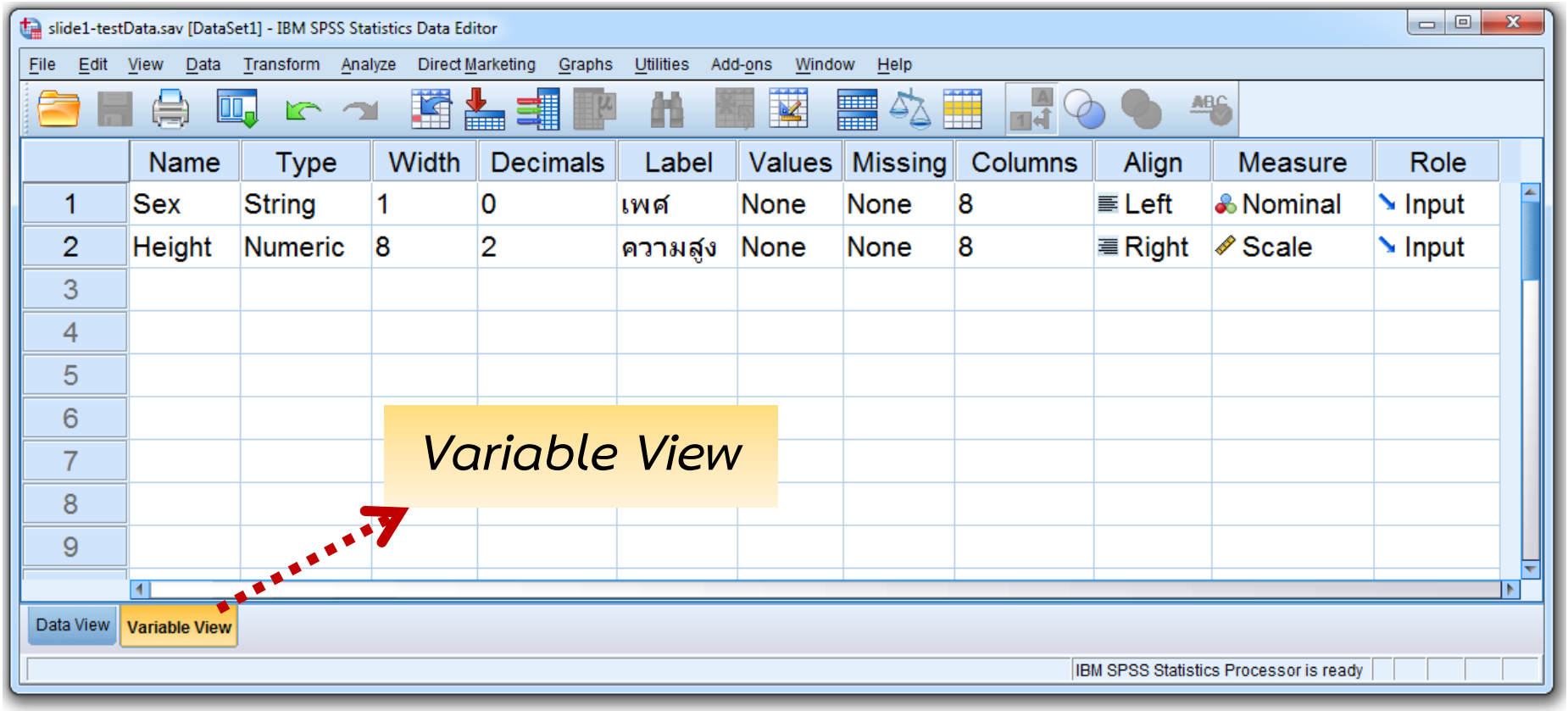
$$S.D. = \sqrt{\frac{\sum_{i=1}^{n}(x_i - \overline{x})^2}{n-1}}$$

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

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

SPSS

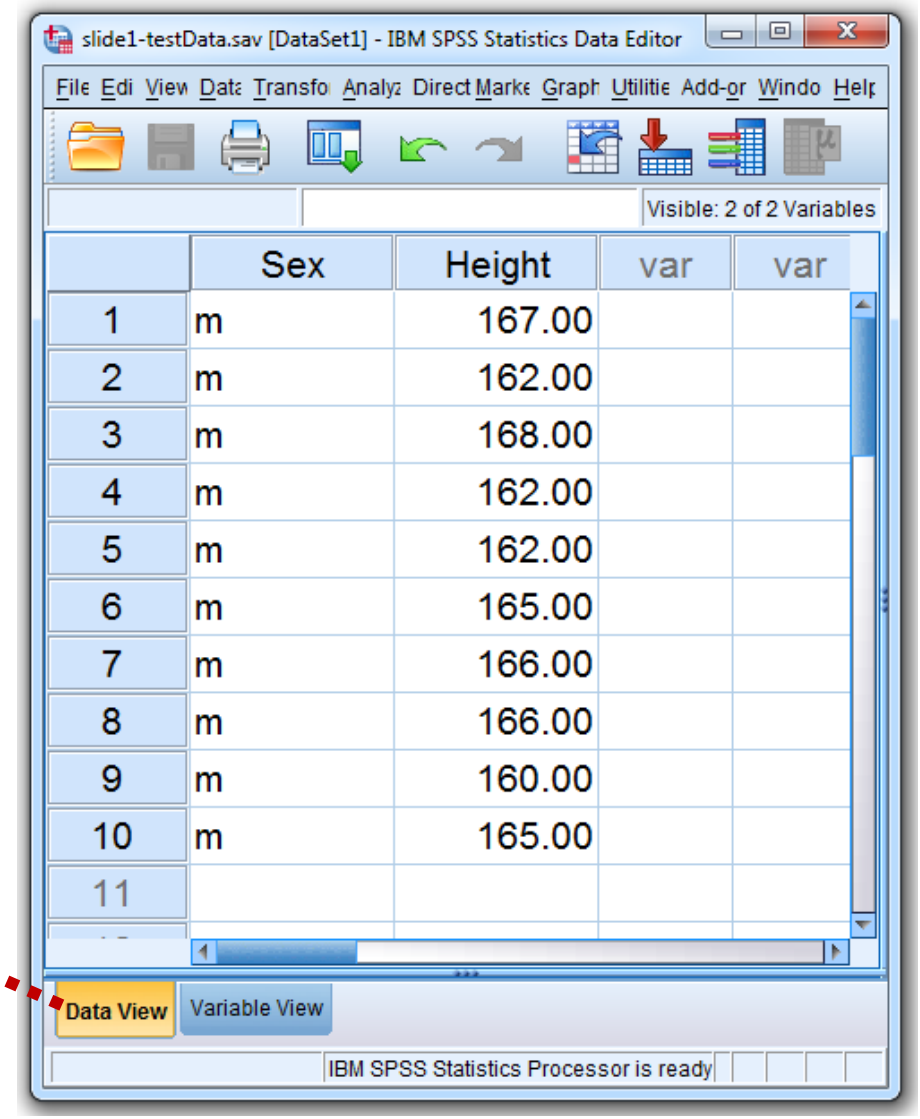
1. Define variables



SPSS

2. Input data

Data View



SPSS

3. Analyze data

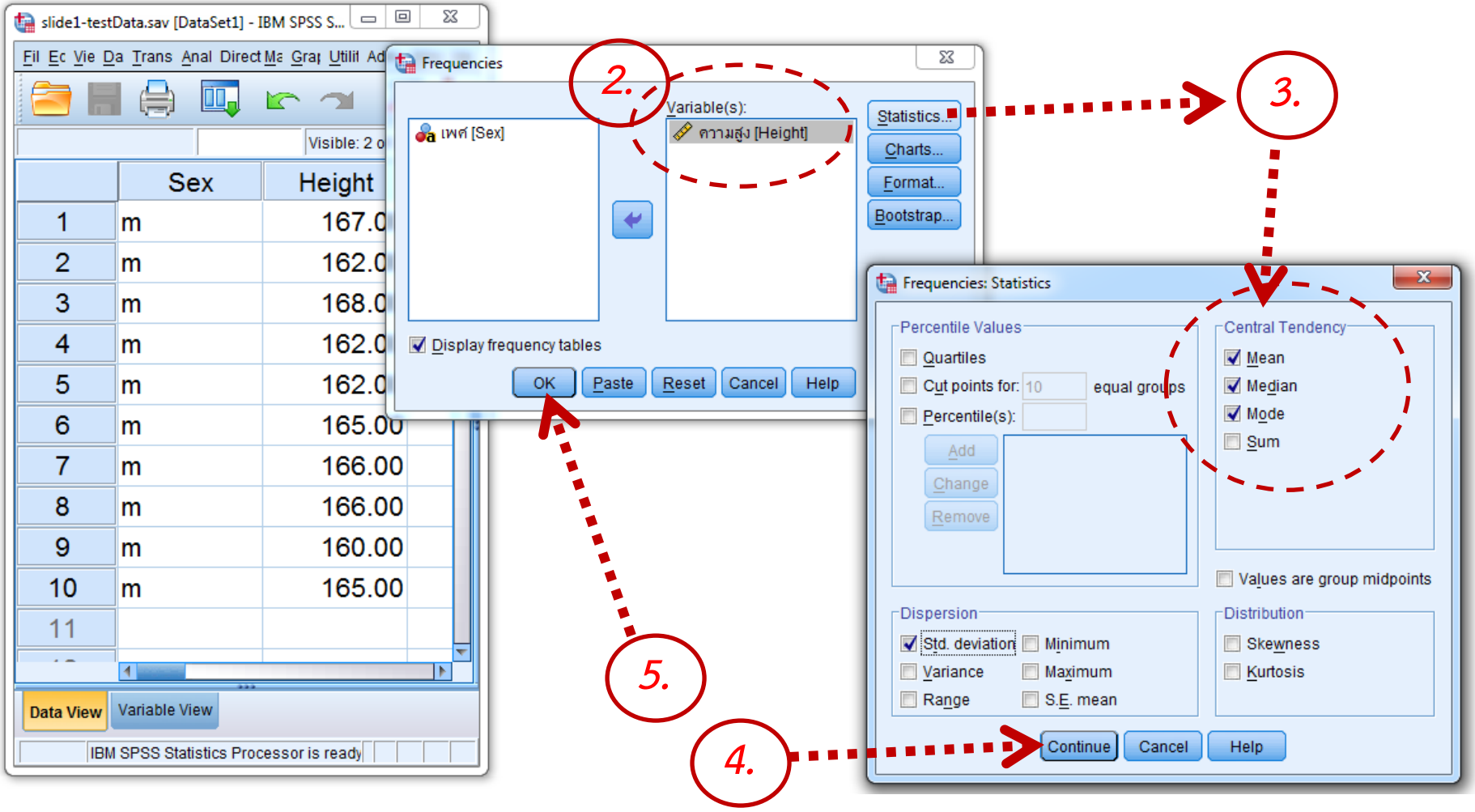
1. Analyze > Descriptive Statistics >Frequencies

2. Select data

3. Choose Statistics

4. Click Continue

5. Click OK



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	