# Part (2): Data Analysis using Minitab

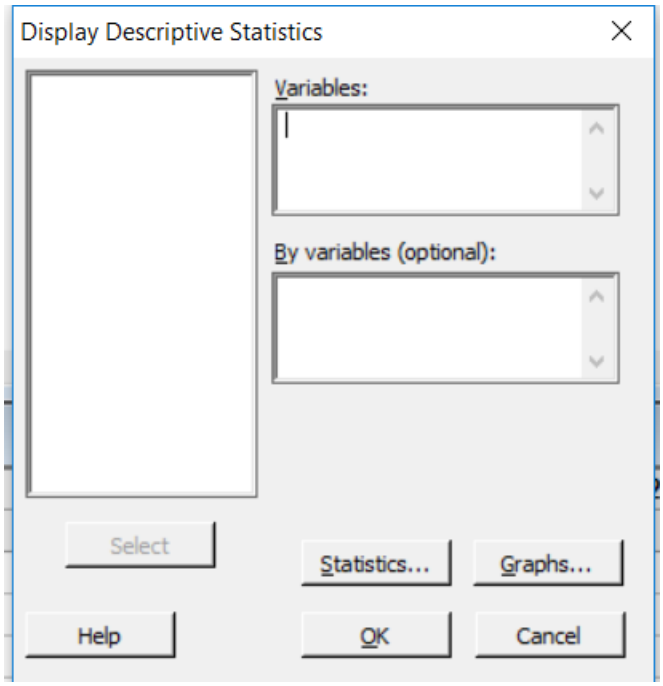
## (1) Descriptive Statistics

The descriptive statistics analysis can be done through using the path

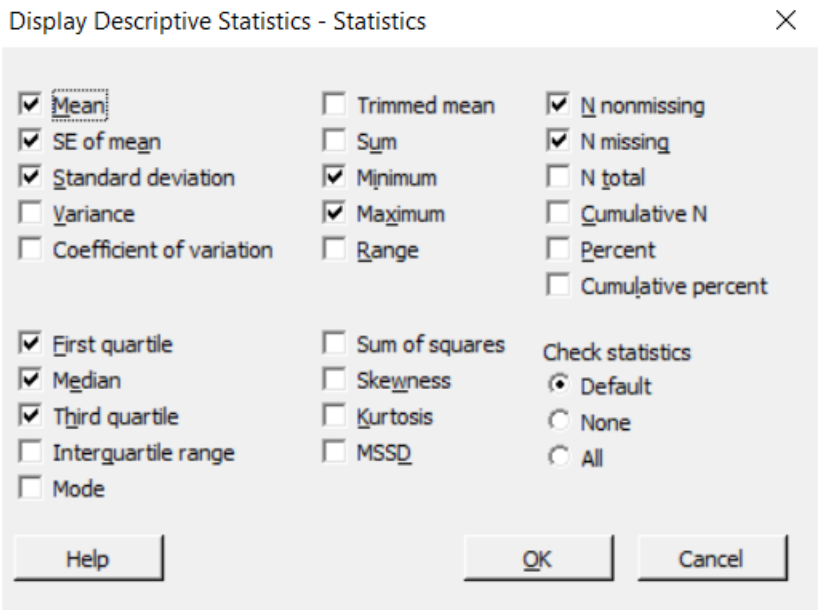
Stat→basic statistics → Descriptive statistics

Then you get three options, they are; display descriptive statistics, store descriptive statistics and graph summary.

Both of display descriptive statistics and store descriptive statistics do the same, the difference is only whether one needs to display the results or store the results in columns. If you select to display the results, you get the following




In which one can select the data variable(s) and click on the statistics option you can select the statistical measures need to be calculated as follows:




Example

Calculate the mean, variance, standard deviation and the coefficient of variation of the following data set.

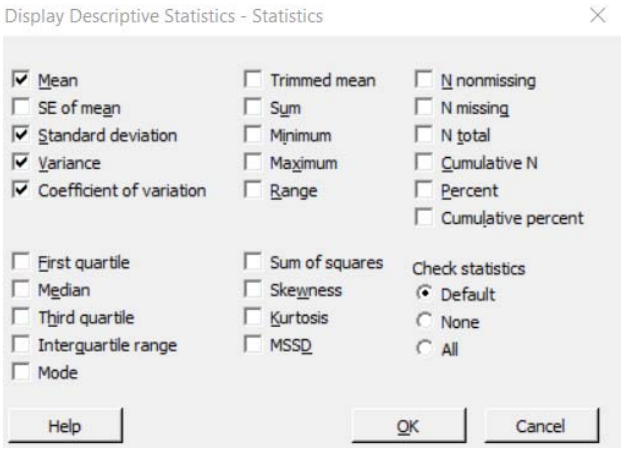
15, 18, 6, 20, 10, 11, 9, 6, 14, 14, 11, 8, 10, 1, 7, 1, 18, 17, 10, 9

1- Enter the data into Minitab under C1.

2- Click Stat, Basic Statistics, Display Descriptive Statistics

3- Click C1, Select, OK

4- Select the queried measures from the statistics option as follows:



The OK, we get

**Descriptive Statistics: C1**

| Variable | Mean | StDev | Variance | CoefVar |
|---|---|---|---|---|
| C1 | 10.75 | 5.30 | 28.09 | 49.30 |

From the results, we see that

The mean is 10.75

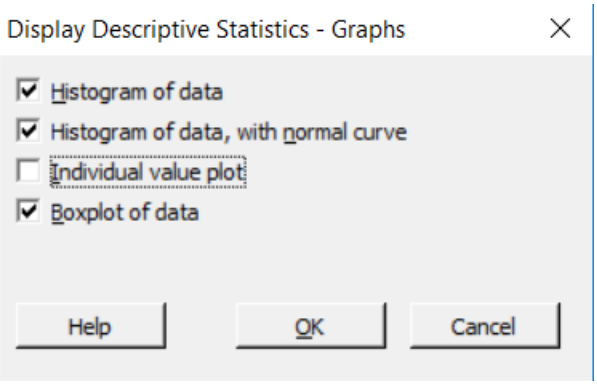
The standard deviation is 5.30

The variance is 28.09

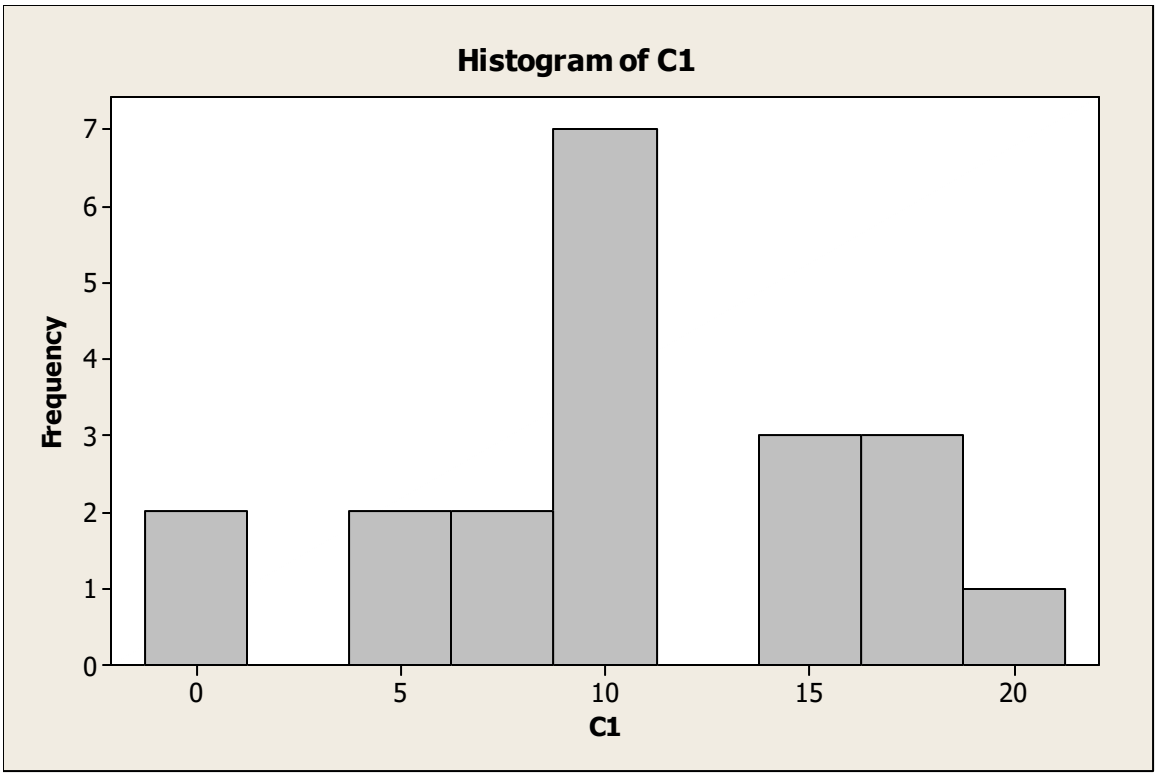
The coefficient of variation is 49.3

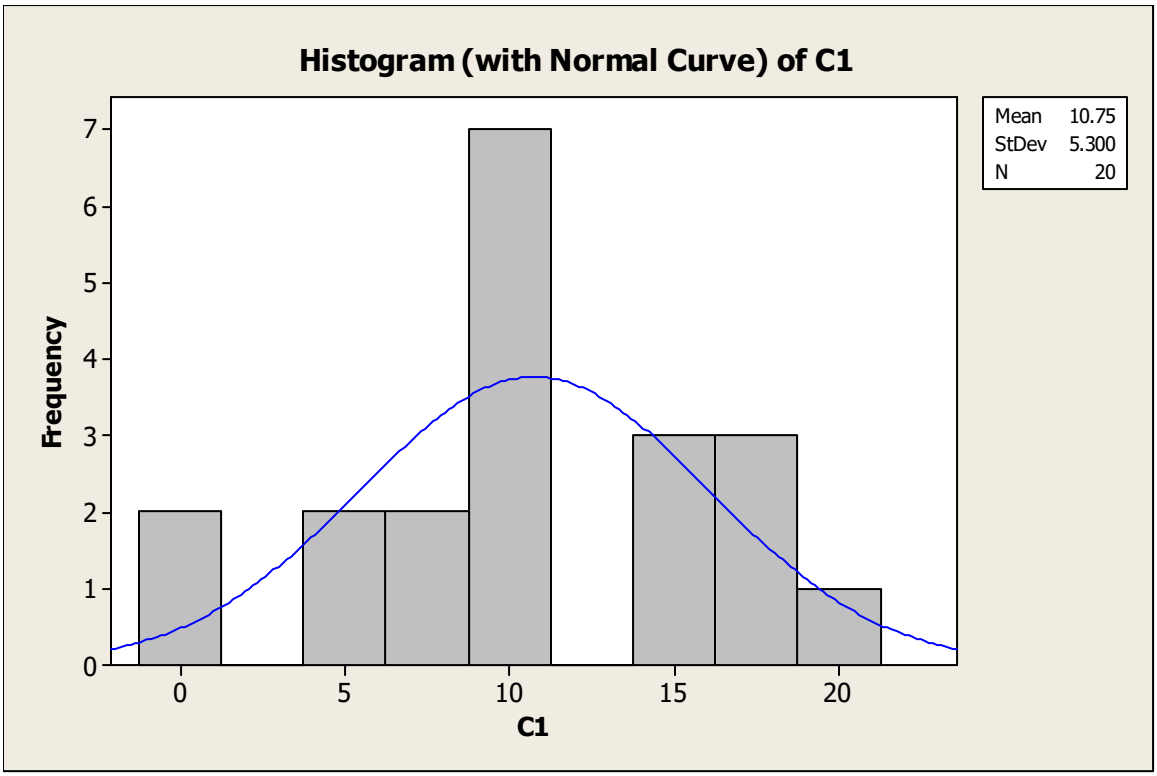
Also, some graphs can be introduced as:

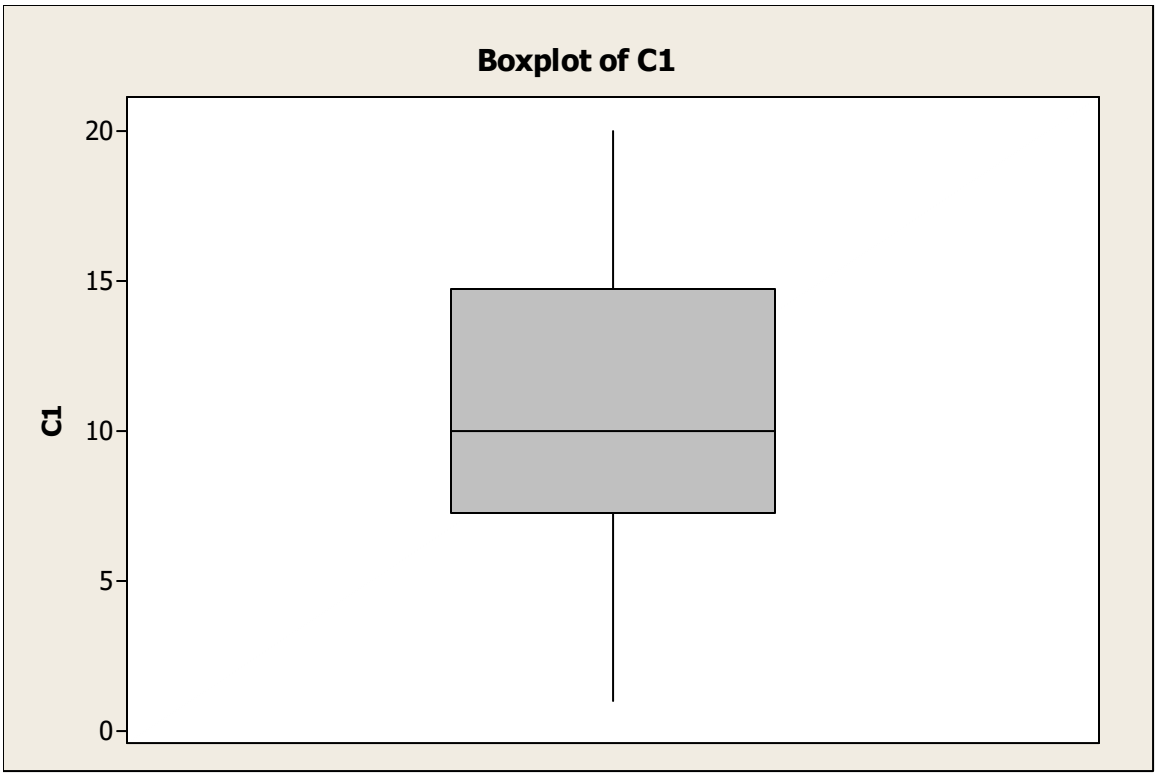
Select the graph options from the list




OK, we get


Histogram of C1
Frequency
0
1
2
3
4
5
6
7
0
5
10
15
20
C1


Histogram (with Normal Curve) of C1
Mean 10.75
StDev 5.300
N 20
Frequency
0
1
2
3
4
5
6
7
0
5
10
15
20
C1




Also, we can analyze two or more variable in the same time based on different categories.

## Example (2).

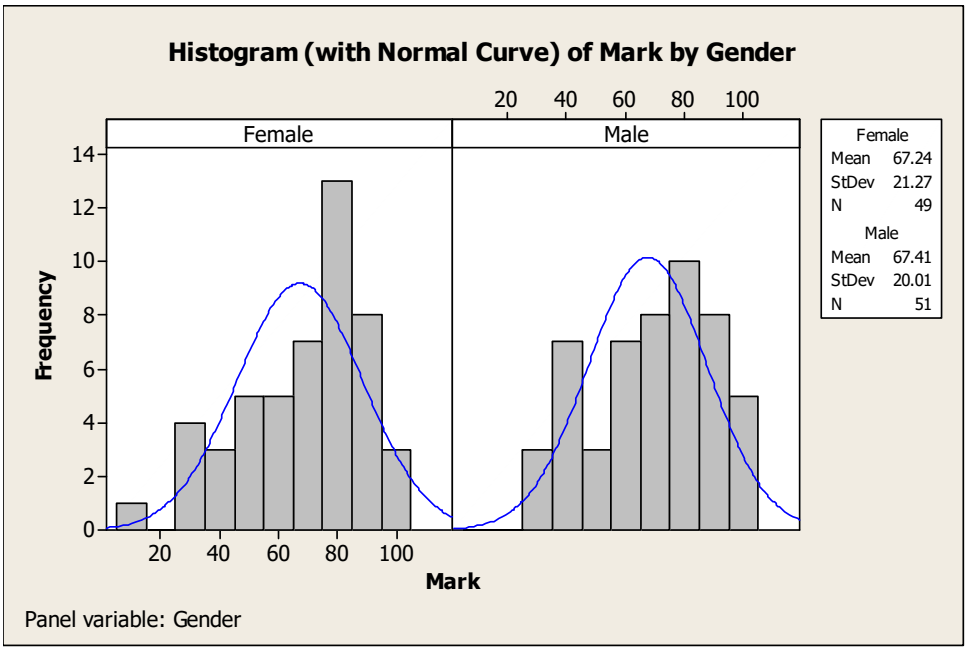
The data given in example-2.xls represents the gender, marks, level and grade of a sample from KSU students in a certain course. Analyze the data based on the different categories.

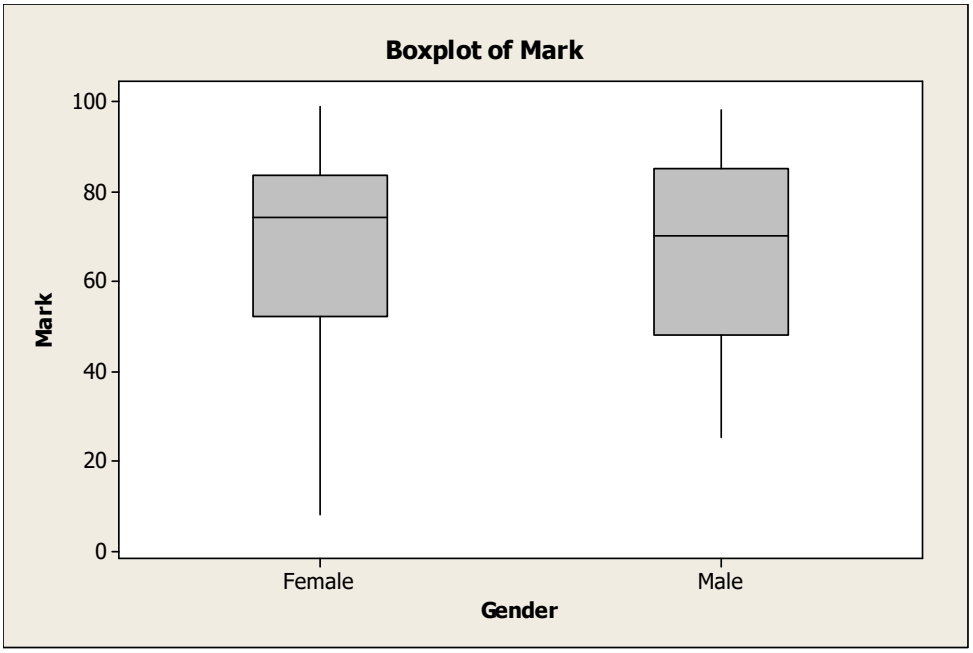
Solutions

Analysis based on the gender

**Descriptive Statistics: Mark**

| Variable | Gender | N | Mean | StDev | Variance | CoefVar |
|---|---|---|---|---|---|---|
| Mark | Female | 49 | 67.24 | 21.27 | 452.44 | 31.63 |
| | Male | 51 | 67.41 | 20.01 | 400.45 | 29.68 |



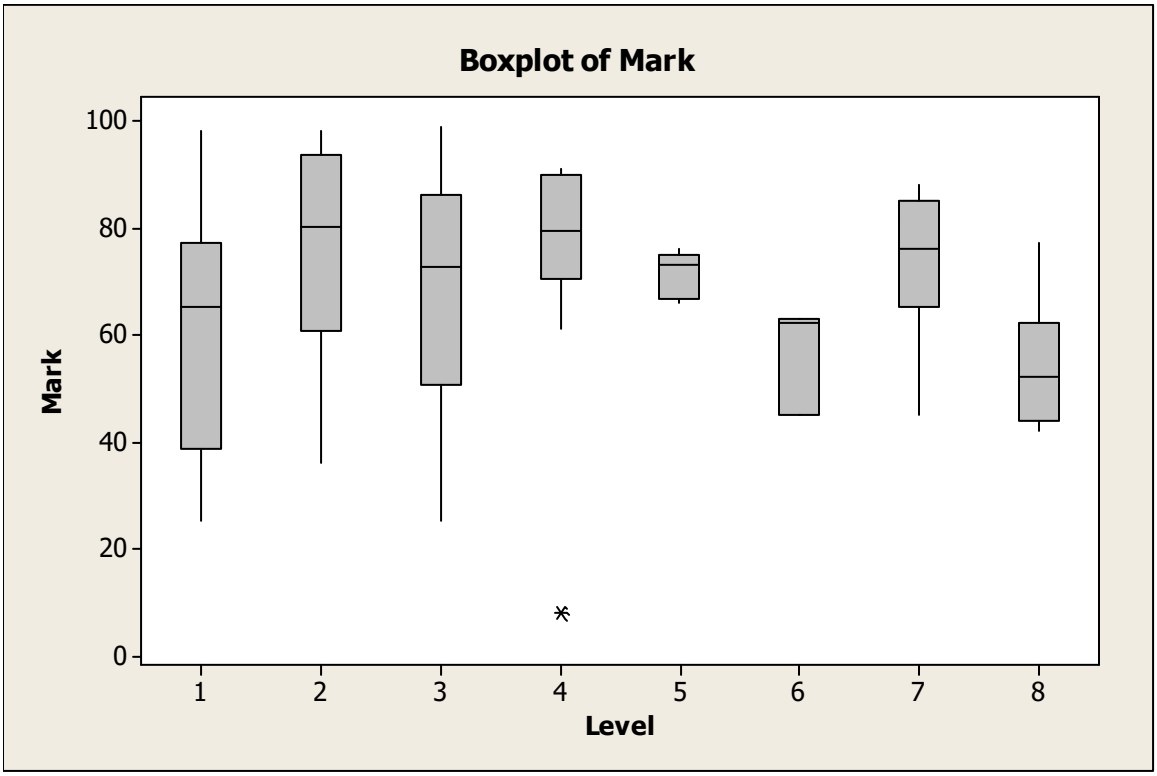

What are your comments about the graphs?

Analysis based on the Levels

**Descriptive Statistics: Mark**

| Variable | Level | N | Mean | StDev | Variance | CoefVar |
|---|---|---|---|---|---|---|
| Mark | 1 | 16 | 58.56 | 22.59 | 510.53 | 38.58 |
| | 2 | 14 | 75.79 | 18.79 | 353.10 | 24.80 |
| | 3 | 36 | 67.22 | 21.51 | 462.75 | 32.00 |
| | 4 | 12 | 74.50 | 23.00 | 529.00 | 30.87 |
| | 5 | 5 | 71.20 | 4.44 | 19.70 | 6.23 |
| | 6 | 3 | 56.67 | 10.12 | 102.33 | 17.85 |
| | 7 | 7 | 74.14 | 15.08 | 227.48 | 20.34 |
| | 8 | 7 | 53.71 | 12.53 | 156.90 | 23.32 |

We present only the boxplot (one can produce the histogram with normal curve)




What are your comments about the graphs?

Analysis based on the gender and level Levels

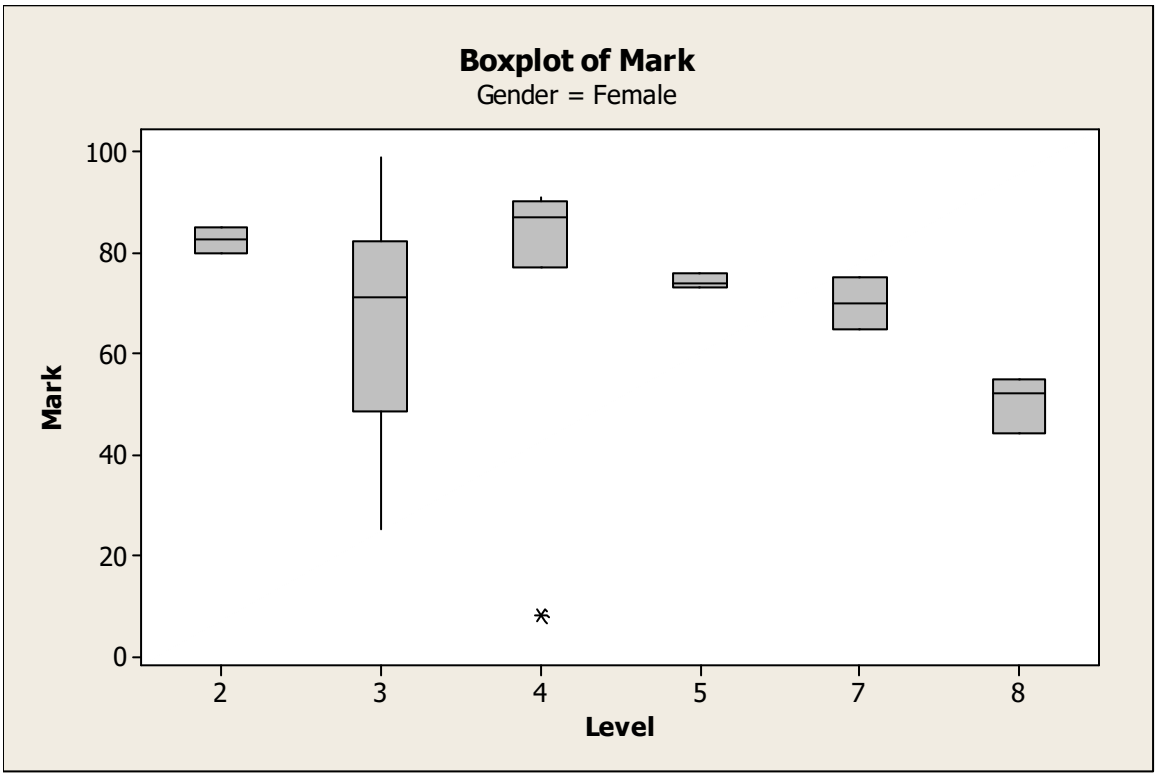
**Descriptive Statistics: Mark**

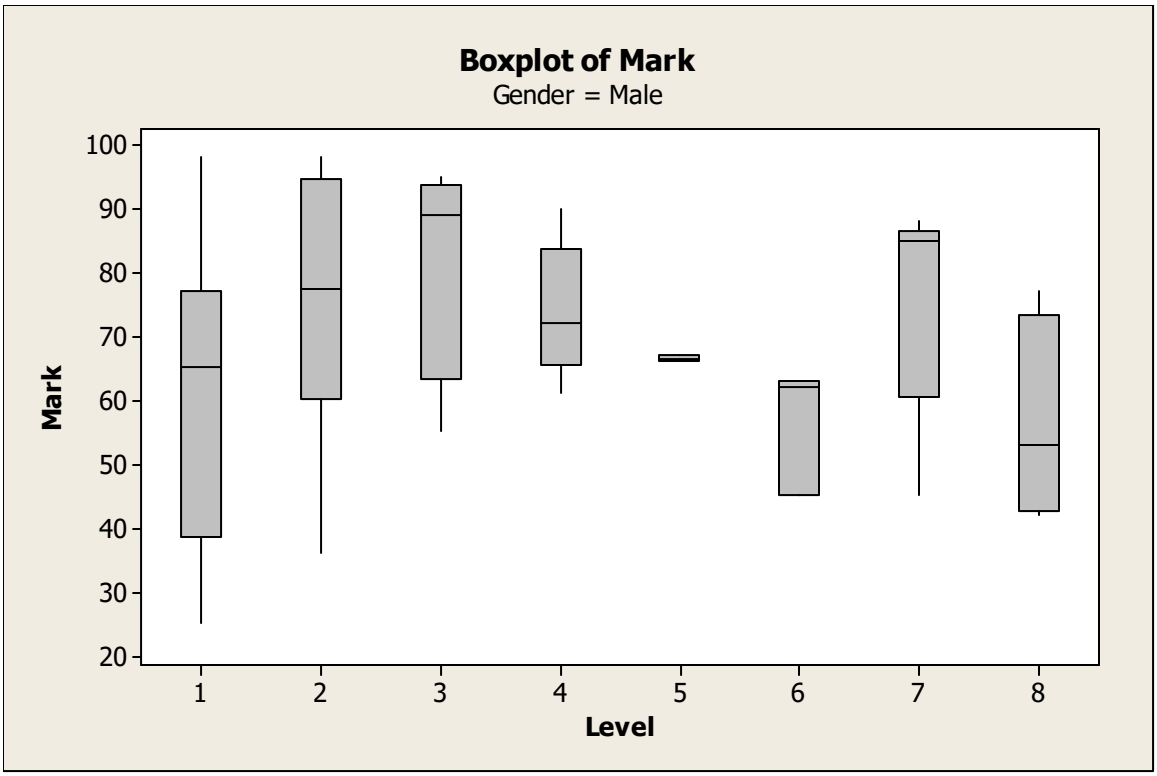
**Results for Gender = Female**

| Variable | Level | N | Mean | StDev | Variance | CoefVar |
|---|---|---|---|---|---|---|
| Mark | 2 | 2 | 82.50 | 3.54 | 12.50 | 4.29 |
| | 3 | 32 | 65.38 | 21.41 | 458.56 | 32.76 |
| | 4 | 7 | 74.9 | 29.9 | 893.8 | 39.94 |
| | 5 | 3 | 74.333 | 1.528 | 2.333 | 2.05 |
| | 7 | 2 | 70.00 | 7.07 | 50.00 | 10.10 |
| | 8 | 3 | 50.33 | 5.69 | 32.33 | 11.30 |

**Results for Gender = Male**

| Variable | Level | N | Mean | StDev | Variance | CoefVar |
|---|---|---|---|---|---|---|
| Mark | 1 | 16 | 58.56 | 22.59 | 510.53 | 38.58 |
| | 2 | 12 | 74.67 | 20.16 | 406.61 | 27.01 |
| | 3 | 4 | 82.00 | 18.24 | 332.67 | 22.24 |
| | 4 | 5 | 74.00 | 10.65 | 113.50 | 14.40 |
| | 5 | 2 | 66.500 | 0.707 | 0.500 | 1.06 |
| | 6 | 3 | 56.67 | 10.12 | 102.33 | 17.85 |
| | 7 | 5 | 75.80 | 17.80 | 316.70 | 23.48 |
| | 8 | 4 | 56.25 | 16.50 | 272.25 | 29.33 |

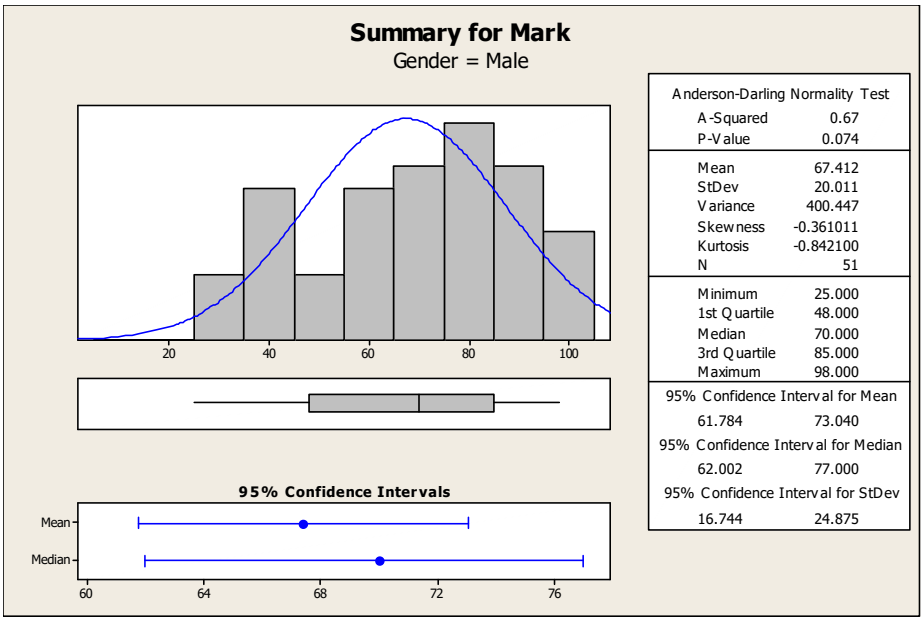


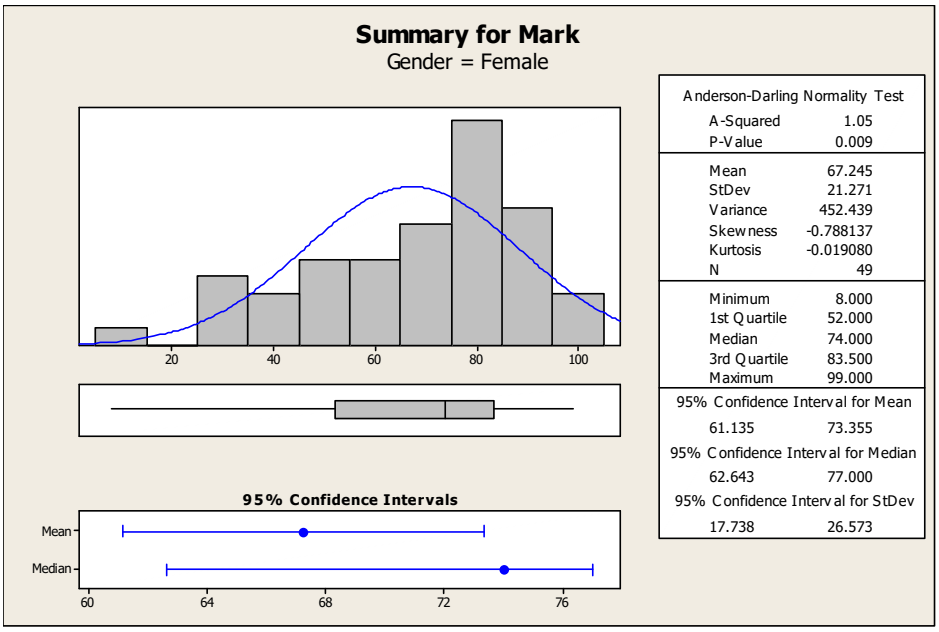



What are your comments about the graphs?

## (2) Graphical Summary

The graphical summary can be also introduced for the marks of both male and female as follows:




What are your comments about the graph summaries?