**In the table, there are given amounts of chocolate bars baught in particular shops in 2 week**
<span style="color:blue">**Task:**</span> **Find number of observations, minimum, maximum, range, sum, average value, mode, m
standard deviation and variance coefficient, skewness, kurtoses.**

| | | | | | | |
|---|---|---|---|---|---|---|
| 14 | 12 | 28 | 18 | 20 | | Number of cases |
| 18 | 15 | 20 | 14 | 16 | | Minimum |
| 25 | 27 | 22 | 17 | 15 | | Maximum |
| 21 | 10 | 25 | 25 | 24 | | Range |
| 20 | 11 | 16 | 25 | 20 | | Sum |
| 13 | 20 | 18 | 29 | 30 | | Average value |
| 18 | 17 | 19 | 11 | 14 | | Mode |
| 27 | 19 | 26 | 27 | 19 | | Median |
| 15 | 17 | 24 | 26 | 26 | | Variance |
| 19 | 22 | 16 | 22 | 27 | | Standard deviation |
| 20 | 25 | 19 | 25 | 13 | | Variance coefficient |
| 24 | 18 | 26 | 14 | 17 | | Skewness |
| 12 | | | | | | Kurtoses |
| 15 | | | | | | |
| 27 | | | | | | |
| 10 | | | | | | |
| 11 | | | | | | |
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| 14 | | | | | | |
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| 26 |
| 27 |
| 13 |
| 17 |

| | Column1 | |
|---|---|---|
| 60 | Mean | 20 |
| 10 | Standard Error | 0.661277654 |
| 30 | Median | 19.5 |
| 20 | Mode | 25 |
| 1200 | Standard Deviation | 5.122234682 |
| 20 | Sample Variance | 26.23728814 |
| 20 | Kurtosis | -0.970885509 |
| 19.5 | Skewness | 0.026614787 |
| 26.24 | Range | 20 |
| 5.12 | Minimum | 10 |
| 0.26 | Maximum | 30 |
| 0.03 | Sum | 1200 |
| -0.97 | Count | 60 |

**Results are in table.**
**Calculate weighted average of grades.**

| Grade | Credits |
|-------|---------|
| 2 | 6 |
| 1 | 6 |
| 1 | 6 |
| 2 | 3 |
| 3 | 5 |
| 1 | 6 |
| 1 | 5 |
| 1 | 3 |
| 2 | 6 |
| 3 | 2 |
| 1 | 6 |
| 2 | 3 |
| 1 | 6 |
| 3 | 6 |
| 2 | 5 |
| 2 | 3 |
| 1 | 6 |
| 3 | 6 |
| 3 | 3 |
| 3 | 6 |
| 1 | 5 |
| 2 | 6 |

**Measures of central tendency:** $\bar{x}$

Mode: $\tilde{x}$ most frequent value

Median: middle value

p-% quantil

Mean:
$$\mu = \frac{1}{N} \sum_{i=1}^{N} x_i$$

Sample average value:
$$x = \frac{1}{n} \cdot \sum_{i=1}^{n} x_i$$

Geometricmean:
$$x_g = \sqrt[n]{x_1 x_2 \ldots x_n}$$

**Measures of variability:**

Range: $R = \max x_i - \min x_i$

Population variance:
$$\sigma^2 = \frac{1}{N} \sum_{i=1}^{N} (x_i - \mu)^2$$

Sample variance:
$$s^2 = \frac{1}{n-1} \sum_{i=1}^{n} (x_i - x)^2$$

Population standard deviation:
$$\sigma = \sqrt{\sigma^2}$$

Sample standard deviation:
$$s = \sqrt{s^2}$$

Coefficient of skewness:
$$S_k = \frac{3(x - \tilde{x})}{s}$$
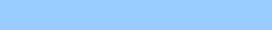
Coefficient of kurtoses

Varianceí coefficient:
$$V = \frac{\sigma}{\bar{x}}$$

Data → Data Analysis → Descriptive Statistics

**Histogram**

Sturgers rule:
$$k = Round(3.3 \log(n)) + 1$$

Data → Data Analysis → Histogram

**Weighted characteristics**

Weighted average value:

$$x_w = \frac{\sum\limits_{i=1}^{k} w_i x_i}{\sum\limits_{i=1}^{k} w_i}$$

Weighted variance:

$$s_w^2 = \frac{\sum\limits_{i=1}^{k} w_i (x_i - x)^2}{\sum\limits_{i=1}^{k} w_i - 1}$$

Weighted standard deviation:

$$s_w = \sqrt{s_w^2}$$

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=MODE.SNGL

=MEDIAN

=AVERAGE

=GEOMEAN

=VAR.P

=VAR.S

=STDEV.P

=STDEV.S

=SKEW

=KURT