## **Weighted Mean (Array)**

Calculate the weighted mean for the following data:

Biology, 5 credits, A- (use 3.667);

Chemistry, 4 credits, B+ (use 3.333);

College Algebra, 3 credits, A (use 4.000);

Health, 2 credits, C (use 2.000);

Debate, 2 credits, B (use 3.000).

If all the courses were the same credits it is ok to calculate Arithmetic Mean. But no.

?

## **Weighted Mean (Ungrouped)**

Prices of 4 raw materials necessary for the production of a good and the amount of these raw materials purchased and consumed are displayed below. Find the mean raw material cost. (Neyran Orhunbilge s.82)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Price of raw material  (100 TL/kg) | Amount purchased  (kg) | Amount consumed  (kg) |  |  |
| Xi | fi | wi | fi wi | fi wi xi |
| 10 | 20 | 0.30 | 6.0 | 60 |
| 25 | 8 | 0.05 | 0.4 | 10 |
| 30 | 10 | 0.20 | 2.0 | 60 |
| 150 | 32 | 0.05 | 1.6 | 240 |
|  |  |  | 10 | 370 |

3700 TL/kg

## **Weighted Mean (Grouped)**

The monthly salaries of workers in a company is as follows. Salary is dependent on seniority (kıdem). What is the average salary paid in this company? (Neyran Orhunbilge s.83)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Monthly average salary  (TL/) | Number of workers  (person) | Seniority  (year) |  |  |  |
| Xi | fi | wi | mi | fi wi | fi wi xi |
| 80-<100 | 30 | 3 | 90 | 90 | 8100 |
| 100-<120 | 25 | 6 | 110 | 150 | 16500 |
| 120-<140 | 17 | 10 | 130 | 170 | 22100 |
| 140-<160 | 15 | 12 | 150 | 180 | 27000 |
| 160-<180 | 10 | 15 | 170 | 150 | 25500 |
| 180-<200 | 3 | 20 | 190 | 60 | 11400 |
|  |  |  |  | 800 | 110600 |

## **Geometric Mean (Array)**

A company calculates declining balance method of depreciation of a machine cost 64 billion TL (Ümit Şenesen p.97). Calculate the average mean of this machine’s book value.

|  |  |  |
| --- | --- | --- |
| Year | Book Value  (thousand TL)  Xi | logXi |
| 1993 | 64 | 1.806 |
| 1994 | 32 | 1.505 |
| 1995 | 16 | 1.204 |
| 1996 | 8 | 0.903 |
| 1997 | 4 | 0.602 |
| 1998 | 2 | 0.301 |
| 1999 | 1 | 0 |



antilog (0.903)= GM = 8 thousand TL

or

=8

If we calculated AM to these data we should get 18.14 thousand TL Compare this with the GM.

## **Geometric Mean (Ungrouped)**

The price changes (%) from 1994 to 1998 of 50 goods is displayed above. What is the price increase of these goods in 1998 subject to 1994. (N.Orhunbilge p.86)

|  |  |  |  |
| --- | --- | --- | --- |
| Price Changes | Goods |  |  |
| Xi | fi | logXi | fi logXi |
| 100 | 20 | 2.0000 | 40.0000 |
| 120 | 12 | 2.0792 | 24.9504 |
| 140 | 8 | 2.1461 | 17.1688 |
| 160 | 6 | 2.2041 | 13.2246 |
| 180 | 4 | 2.2553 | 9.0212 |
|  |  |  | 104.3650 |



antilog (2.0873) = GM = 122.3

An increase of 22.3%

## **Geometric Mean (Grouped)**

Determine the sector’s growth rate in 2010 by the help of 80 companies’ growth rates in this sector. ( N.Orhunbilge p.87)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Growth rate | Number of firms |  |  |  |
| Xi | fi | mi | logmi | fi logmi |
| 90-<96 | 20 | 93 | 1.9685 | 39.3700 |
| 96-<112 | 10 | 99 | 1.9956 | 19.9560 |
| 112-<118 | 8 | 105 | 2.0212 | 16.1696 |
| 118-<124 | 13 | 111 | 2.0453 | 26.5889 |
| 124-<130 | 7 | 127 | 2.1038 | 14.7266 |
| 130-<136 | 22 | 133 | 2.1239 | 46.7258 |
|  | 80 |  |  | 163.5369 |



antilog (2.0442) = GM = 110.7

Growth rate is 10.7%.

## **First - Third Quartile (Array)**

The salaries in a firm are as follows. Find the interquartile range.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 850 | 890 | 920 | 950 | 1000 | 1150 | 1200 | 1250 | 1320 | 1500 |

## **First - Third Quartile (Ungrouped)**

A random sample of 300 personal property insurance policies showed the following number of claims over the past two years.

1. Estimate the interquartile range.

|  |  |
| --- | --- |
| Number of Claims | Number of policies |
| Xi | fi |
| 0 | 15 |
| 1 | 25 |
| 2 | 50 |
| 3 | 90 |
| 4 | 30 |
| 5 | 70 |
| 6 | 15 |
| 7 and + | 5 |
|  | 300 |

## **First - Third Quartile (Grouped)**

The accompanying table shows the marks of 150 students for the Introduction to Statistics Module.

1. Estimate the minimum mark obtained by the 75% of the students.
2. Estimate the mark obtained by the 50% of the students.
3. Estimate the minimum mark obtained by the 25% of the students.
4. Estimate the interquartile range.

|  |  |
| --- | --- |
| Marks | Number of students |
| Xi | fi |
| 0-<10 | 5 |
| 10-<20 | 12 |
| 20-<30 | 23 |
| 30-<40 | 30 |
| 40-<50 | 38 |
| 50-<60 | 25 |
| 60-<70 | 9 |
| 70-<80 | 5 |
| 80-<100 | 3 |
|  | 150 |