**UNIT-I**

**Measures of Central Tendency:** In the study of a population with respect to one in which we are interested we may get a large number of observations. It is not possible to grasp any idea about the characteristic when we look at all the observations. So it is better to get one number for one group. That number must be a good representative one for all the observations to give a clear picture of that characteristic. Such representative number can be a central value for all these observations. This central value is called a measure of central tendency or an average or a measure of locations. There are five averages. Among them mean, median and mode are called simple averages and the other two averages geometric mean and harmonic mean are called special averages.

**Characteristics for a good or an ideal average:** The following properties should possess for an ideal average.

1. It should be rigidly defined.
2. It should be easy to understand and compute.
3. It should be based on all items in the data.
4. Its definition shall be in the form of a mathematical formula.
5. It should be capable of further algebraic treatment.
6. It should have sampling stability.
7. It should be capable of being used in further statistical computations or processing.

**Arithmetic mean or mean:** Arithmetic mean or simply the mean of a variable is defined as the sum of the observations divided by the number of observations. If the variableassumes values then the mean, is given by



This formula is for the ungrouped or raw data.

 **Example 1:** Calculate the mean for 2, 4, 6, 8, 10

**Solution:** We have



 

**Short-Cut method:** Under this method an assumed or an arbitrary average (indicated by A) is used as the basis of calculation of deviations from individual values. The formula is



where, A = the assumed mean or any value in x

d = the deviation of each value from the assumed mean

**Example 2:** A student’s marks in 5 subjects are 75, 68, 80, 92 and 56. Find his average mark.

Solution: let A=68

|  |  |
| --- | --- |
| x | D=x-A=x-68 |
| 75 | 75-68=7 |
| 68 | 68-68=0 |
| 80 | 80-68=12 |
| 92 | 92-68=24 |
| 56 | 56-68=-12 |
| Total | 31 |

We have





**Grouped Data:** The mean for grouped data is obtained from the following formula:



where x = the mid-point of individual class

f = the frequency of individual class

N = the sum of the frequencies or total frequencies.

 **Short-cut method**:



where 

A = Assumed mean or any value in x

 N = total frequency

c = width of the class interval

**Example 3:** Given the following frequency distribution, calculate the arithmetic mean

 Marks: 64 63 62 61 60 59

No. of students: 8 18 12 9 7 6

**Solution:** Let assumed mean=62

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **x** | **f** | **fx** | **d=x-a=x-62** | **fd** |
| 64 | 8 | 512 | 64-62=2 | 16 |
| 63 | 18 | 1134 | 63-62=1 | 18 |
| 62 | 12 | 744 | 62-62=0 | 0 |
| 61 | 9 | 549 | 61-62=-1 | -9 |
| 60 | 7 | 420 | 60-62=-2 | -14 |
| 59 | 6 | 354 | 59-62=-3 | -18 |
| **Total** | **60** | **3713** |  | **-7** |

**Direct Method:**

We have





**Short-cut method**:



**Short-cut method**:



**Example 4:** Following is the distribution of persons according to different income groups. Calculate arithmetic mean.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Income (Rs thousands) | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 |
| No. of persons | 6 | 8 | 10 | 12 | 7 | 4 | 3 |

**Solution: let A=35**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Income | Number of Persons (f) | Mid value X |  | fd |
| 0-10 | 6 | 5 | -3 | -18 |
| 10-20 | 8 | 15 | -2 | -16 |
| 20-30 | 10 | 25 | -1 | -10 |
| 30-40 | 12 | 35 | 0 | 0 |
| 40-50 | 7 | 45 | 1 | 7 |
| 50-60 | 4 | 55 | 2 | 8 |
| 60-70 | 3 | 65 | 3 | 9 |
| **Total** | **50** |  |  | **-20** |





**Merits and demerits of Arithmetic mean:**

 **Merits:**

1. It is rigidly defined.

 2. It is easy to understand and easy to calculate.

 3. If the number of items is sufficiently large, it is more accurate and more reliable.

4. It is a calculated value and is not based on its position in the series.

5. It is possible to calculate even if some of the details of the data are lacking.

 6. Of all averages, it is affected least by fluctuations of sampling.

7. It provides a good basis for comparison.

**Demerits:**

1. It cannot be obtained by inspection nor located through a frequency graph.

2. It cannot be in the study of qualitative phenomena not capable of numerical measurement i.e. Intelligence, beauty, honesty etc.

 3. It can ignore any single item only at the risk of losing its accuracy.

4. It is affected very much by extreme values.

5. It cannot be calculated for open-end classes. 6. It may lead to fallacious conclusions, if the details of the data from which it is computed are not given.

**MEDIAN :** In the words of L.R. Conner : "The median is that value of the variable which divides the data in two equal parts, one part comprising all the values greater and the other, all values less than median." Thus, as against arithmetic mean which is based on all the items of the distribution, the median is only positional average, i.e. the value depends on the position occupied by a value in the frequency distribution.

**Computation of Median**

**Ungrouped data:** If the number of observation is odd, then the median is the middle value after the observations have been arranged in ascending or descending order of magnitude. In case of even number of observations median is obtained as the arithmetic mean of two middle observations after they are arranged in ascending or descending order of magnitude.

**Problem:** The marks obtained by 12 students out of 50 are: 25, 20, 23, 32, 40, 27, 30, 25, 20, 10, 15, and 41

**Solution:** The values obtained by 12 students arranged in ascending order as: 10, 15,

20, 20, 23, 25, 25, 27, 30, 32, 40, 41

Here the number of items ’N’ = 12, which is even.

The two middle items are 6th and 7th items

i.e.,  is the median value.

**Frequency (Discrete) Distribution:** In case of frequency distribution where the variables take the value X1, X2, ......, Xn with respective frequencies f1, f2, ......, fn with , median is the size of the  item or observation. In this case the use of cumulative frequency (c.f.) distribution facilitates the calculations. The steps involved are:

(i) Prepare the less than cumulative frequency (c.f.) distribution.

(ii) Find N/2.

(iii) Find the c.f. just greater than N/2.

(iv) The corresponding value gives the median.

**Problem:** From the following data find the value of median:

Income (Rs.) 1000 1500 800 2000 2100 1700

No. of Persons 24 26 14 10 5 28

**Solution:**

|  |  |  |
| --- | --- | --- |
| *Income arranged in ascending order* | *No. of persons**(f)* | *c.f.* |
| 800 | 14 | 14 |
| 1000 | 24 | 38 |
| 1500 | 26 | 64 |
| 1700 | 28 | 92 |
| 2000 | 10 | 102 |
| 2100 | 5 | 107 |

Median = Size of (N/2)th item = 107/2 = 53.5

53.5th item is consisted in the c.f. = 64. The corresponding value to this = 1500. Hence

Median = Rs. 1500.

**Continuous Frequency Distribution:** Steps involved for its computation are:

(i) Prepare less than cumulative frequency (c.f.) distribution.

(ii) Find N/2.

(iii) Locate c.f. just greater than N/2.

(iv) The corresponding class contains the median value and is called the median class.

(v) The value of median is now obtained by using the interpolation formula:



Where L is the lower limit or boundary of the median class;

f is the frequency of the median class;

h is the magnitude or width of class interval;

 is the total frequency; and

C is the cumulative frequency of the class preceding the median class.

**Problem:** The annual profits (in Rs. lacs) shown by 60 firms are given below:

Profits: 15-20 20-25 25-30 30-35 35-40 40-45 45-50 50-55 55-60 60-65

No. of firms: 4 5 11 6 5 8 9 6 4 2

Calculate the median.

**Solution:**

|  |  |  |
| --- | --- | --- |
| *Profits* | *No. of firms**(f)* | *Cumulative frequency**c.f.* |
| 15-20 | 4 | 4 |
| 20-25 | 5 | 9 |
| 25-30 | 11 | 20 |
| 30-35 | 6 | 26 |
| 35-40 | 5 | 31 |
| 40-45 | 8 | 39 |
| 45-50 | 9 | 48 |
| 50-55 | 6 | 54 |
| 55-60 | 4 | 58 |
| 60-65 | 2 | 60 |

Median item = N/2 =60/2= 30

The cumulative frequency just greater than 30 is 31 and is corresponding class 35-40 is the median class.





**Merits and Limitations of Median**

The median is superior to arithmetic mean in certain aspects. For example, it is especially useful in case of open-ended distribution and also it is not influenced by the presence of extreme values. In fact when extreme values are present in a series, the median is more satisfactory measure of central tendency than the mean.

However, since median is positional average, its value is not determined by each and every observation. Also median is not capable of algebraic treatment. For example, median cannot be used for determining the combined median of two or more groups. Furthermore, the median tends to be rather unstable value if the number of observations

is small.

**MODE:** Mode is the value which occurs most frequently in the set of observations. It is the point of maximum frequency or the point of greatest density. In other words, the mode or modal value of the distribution is that value of the variate for which frequency is maximum.

**Computation of Mode**

1. In case of discrete frequency distribution, mode is the value of the variable corresponding to the maximum frequency.

But in any one (or more) of the following cases:

1. If the maximum frequency is repeated
2. If the maximum frequency occurs in the very beginning or at the end of the distribution
3. If there are irregularities in the distribution, the value of mode is determined by the method of grouping.
4. In case of continuous frequency distribution, mode is given by the formula :



Where, l is lower limit, h the width and fm the frequency of the modal class; f1 and f2 are the frequencies the classes preceding and succeeding the modal class respectively.

Note:

1. For symmetric distribution mean mode and median coincide.
2. When mode is ill defined i.e., where the method of grouping also fails, its value is ascertained by the formula

Mode=3 Median – 2 Mean

**Example: if seven men are receiving daily wages of Rs 150, 160, 170, 170, 170, 180 and 200. Find the modal wages.**

**Solution: S**ince 170 occur thrice and no other item occurs three times or more than three times, hence modal wages is Rs 170.

**Example: Determine the mode from the following frequency distribution:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| F  | 4 | 9 | 16 | 25 | 22 | 16 | 8 | 3 |

**Solution:** Here maximum frequency is 25and the corresponding value of X is 4. Hence mode is 4.

**Example: Calculate the mode from the following frequency distribution:**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Size (x) | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| Frequency (f)  | 2 | 5 | 8 | 9 | 12 | 14 | 14 | 15 | 11 | 13 |

**Solution: method of grouping**

|  |  |
| --- | --- |
| Size (x) | frequency |
| I  | II | III | IV | V | VI |
| 4 | 2 | 7 | 13 | 15 | 22 | 29 |
| 5 | 5 |
| 6 | 8 | 17 |
| 7 | 9 | 21 | 35 |
| 8 | 12 | 26 | 40 |
| 9 | 14 | 28 | 43 |
| 10 | 14 | 29 | 40 |
| 11 | 15 | 26 | 39 |
| 12 | 11 | 24 |
| 13 | 13 |

In column I, original frequencies are written.

In column II, frequencies of column I are combined two by two.

In column III, leave the first frequency of column I and combine the others two by two.

In column IV, frequencies of column I are combined three by three.

In column V, leave the first frequency of column I and combine the others three by three.

In column VI, leave the first two frequencies in column I and combine the others three by three.

Now, we frame another table in which against every maximum item in column I to VI, we write down the corresponding size or sizes. The size (x) which occurs maximum number of times is the mode.

|  |  |
| --- | --- |
| Columns  | Size of item having maximum frequency  |
| I  | 11 |
| II | 10,11 |
| III | 9,10 |
| IV | 10,11,12 |
| V | 8,9,10 |
| VI | 9,10,11 |

 Since the item 10 occurs maximum number of times i.e., 5 times, hence the mode is 10.

**Problem 10: find the** mode of the following data :

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Marks  | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 | 80-90 | 90-100 |
| No. of candidates | 3 | 5 | 7 | 10 | 12 | 15 | 12 | 6 | 2 | 8 |

**Solution:** Since the highest frequency is15, the modal class is 50-60.

Where, l= lower limit of modal class=50

 h = width of modal class=10

fm = frequency of the modal class=15

f1 = frequency of the classes preceding the modal class=12

f2 = frequency of the classes succeeding the modal class=12

We have





**Measures of Dispersion:**

The measure of central tendency serve to locate the center of the distribution, but they do not reveal how the items are spread out on either side of the center. This characteristic of a frequency distribution is commonly referred to as dispersion. In a series all the items are not equal. There is difference or variation among the values. The degree of variation is evaluated by various measures of dispersion. Small dispersion indicates high uniformity of the items, while large dispersion indicates less uniformity. For example consider the following marks of two students.

|  |  |
| --- | --- |
| Student I | Student II |
| 68 | 85 |
| 75 | 90 |
| 65 | 80 |
| 67 | 25 |
| 70 | 65 |

Both have got a total of 345 and an average of 69 each. The fact is that the second student has failed in one paper. When the averages alone are considered, the two students are equal. But first student has less variation than second student. Less variation is a desirable characteristic.

**Characteristics of a good measure of dispersion:**

An ideal measure of dispersion is expected to possess the following properties:

1. It should be rigidly defined

2. It should be based on all the items.

3. It should not be unduly affected by extreme items.

4. It should lend itself for algebraic manipulation.

5. It should be simple to understand and easy to calculate.

**Absolute and Relative Measures:**

There are two kinds of measures of dispersion, namely absolute measure of dispersion and relative measure of dispersion.

Absolute measure of dispersion indicates the amount of variation in a set of values in terms of units of observations. For example, when rainfalls on different days are available in mm, any absolute measure of dispersion gives the variation in rainfall in mm. On the other hand relative measures of dispersion are free from the units of measurements of the observations. They are pure numbers. They are used to compare the variation in two or more sets, which are having different units of measurements of observations. The various absolute and relative measures of dispersion are listed below.

|  |  |
| --- | --- |
| **Absolute measure** | **Relative measure** |
| Range | Co-efficient of Range |
| Quartile deviation | Co-efficient of Quartile deviation |
| Mean deviation | Co-efficient of Mean deviation |
| Standard deviation | Co-efficient of variation |

**Range and coefficient of Range:**

**Range:** The range is the simplest measure of dispersion. It is the rough measure of dispersion. Its measure depends upon the extreme items and not on all the items. It is defined as the difference between the largest and smallest values of the variable.

In symbols, Range = L – S.

Where L = Largest value.

S = Smallest value.

In individual observations and discrete series, L and S are easily identified. In continuous series, the following two methods are followed.

**Method 1:**

L = Upper boundary of the highest class

S = Lower boundary of the lowest class.

**Method 2:**

L = Mid value of the highest class.

S = Mid value of the lowest class.

**Co-efficient of Range:**



**Example1:**

Find the value of range and it’s co-efficient for the following data.

7, 9, 6, 8, 11, 10, 4

**Solution:** Here L=11 and S = 4.

We have

Range = L – S = 11- 4 = 7

Also, 



**Example 2:** Calculate range and its co-efficient from the following distribution.

Size: 60-63 63-66 66-69 69-72 72-75

Number: 5 18 42 27 8

**Solution:**

L = Upper boundary of the highest class = 75

S = Lower boundary of the lowest class = 60

We have

Range = L – S = 75 – 60 = 15

Also, 



**Merits and Demerits of Range:**

**Merits:**

1. It is simple to understand.
2. It is easy to calculate.
3. In certain types of problems like quality control, weather forecasts, share price analysis, etc., range is most widely used.

**Demerits:**

1. It is very much affected by the extreme items.
2. It is based on only two extreme observations.
3. It cannot be calculated from open-end class intervals.
4. It is not suitable for mathematical treatment.
5. It is a very rarely used measure.

**Quartile deviation:** The difference between the upper and lower quartiles i.e., Q3-Q1 is known as the inter quartile range and half of it i.e.,  is called the semi inter quartile range or the quartile deviation (Q.D).



It is better measure of dispersion than range. By eliminating the lowest 25% and highest 25% of items in a series, we are left with the central 50%, which are ordinarily free of extreme values.



**Example:** Find the Quartile Deviation and coefficient of quartile deviation for the following data:

391, 384, 591, 407, 672, 522, 777, 733, 1490, 2488

**Solution:**

Arrange the given values in ascending order.

384, 391, 407, 522, 591, 672, 733, 777, 1490, 2488.

We have

 



Q1 = 2nd value + 0.75 (3rd value – 2nd value )

 = 391 + 0.75 (407 – 391)

 = 391 + 0.75 16

 = 391 + 12

 = 403

We have

 



Q3 = 8th value + 0.25 (9th value – 8th value)

 = 777 + 0.25 (1490 – 777)

 = 777 + 0.25 (713)

 = 777 + 178.25

 = 955.25

We know that





Also,





**Example:** Calculated the Quartile Deviation and Coefficient of Quartile deviation from the following data:

Age in years: 20 30 40 50 60 70 80

No. of members: 3 61 132 153 140 51 3

**Solution**:

|  |  |  |
| --- | --- | --- |
| Age in years | No. of members | c.f |
| 20 | 3 | 3 |
| 30 | 61 | 64 |
| 40 | 132 | 196 |
| 50 | 153 | 349 |
| 60 | 140 | 489 |
| 70 | 51 | 540 |
| 80 | 3 | 543 |
| Total  | N=543 |  |

We have

 



We have

 

We know that





Also,





**Example:** Calculated the Quartile Deviation and Coefficient of Quartile deviation from the following data:

Marks: 0-5 5-10 10-15 15-20 20-25 25-30

No. of students: 4 6 8 12 7 2

**Solution**:

|  |  |  |
| --- | --- | --- |
| Marks  | No. of students | c.f |
| 0-5 | 4 | 4 |
| 5-10 | 6 | 10 |
| 10-15 | 8 | 18 |
| 15-20 | 12 | 30 |
| 20-25 | 7 | 37 |
| 25-30 | 2 | 39 |
| Total  | N=39 |  |

Here N=39





We have







We have



We know that





Also,





**Merits and Demerits of Quartile Deviation**

**Merits:**

1. It is Simple to understand and easy to calculate
2. It is not affected by extreme values.
3. It can be calculated for data with open end classes also.

**Demerits:**

1. It is not based on all the items. It is based on two positional values Q1 and Q3 and ignores the extreme 50% of the items
2. It is not amenable to further mathematical treatment.
3. It is affected by sampling fluctuations.

**Mean Deviation or Average Deviation:** The range and quartile deviation are not based on all observations. They are positional measures of dispersion. They do not show any scatter of the observations from an average. The mean deviation is measure of dispersion based on all items in a distribution.

Mean deviation is the arithmetic mean of the deviations of a series computed from any measure of central tendency; i.e., the mean, median or mode, all the deviations are taken as positive i.e., signs are ignored. According to Clark and Schekade, “Average deviation is the average amount scatter of the items in a distribution from either the mean or the median, ignoring the signs of the deviations”.

We usually compute mean deviation about any one of the three averages mean, median or mode. Sometimes mode may be ill defined and as such mean deviation is computed from mean and median. Median is preferred as a choice between mean and median. But in general practice and due to wide applications of mean, the mean deviation is generally computed from mean. M.D can be used to denote mean deviation.

If  be n observations, then mean deviation from the average A, (usually mean, mode or mode) is given by



If is the frequency distribution, then mean deviation from the average A, (usually mean, mode or mode) is given by



Where  represents the modulus or absolute value of the deviation, where the negative sign is ignored.

Since mean deviation is based on all the observations, it is better measure of dispersion than range or quartile deviation. But the step of ignoring the signs of the deviations  creates artificiality and renders it useless for further mathematical treatment.

**Coefficient of mean deviation:** Mean deviation calculated by any measure of central tendency is an absolute measure. For the purpose of comparing variation among different series, a relative mean deviation is required. The relative mean deviation is obtained by dividing the mean deviation by the average used for calculating mean deviation.



If the result is desired in percentage, then



**Example:** Calculate mean deviation from mean and median for the following data:

100,150,200,250,360,490,500,600,671. Also calculate coefficients of mean deviation.

**Solution:**

We know that





Now arrange the data in ascending order

100, 150, 200, 250, 360, 490, 500, 600, 671





|  |  |  |
| --- | --- | --- |
|  |  |  |
| 100 | =269 | =260 |
| 150 | =219 | =210 |
| 200 | =169 | =160 |
| 250 | =119 | =110 |
| 360 | =9 | =0 |
| 490 | =121 | =130 |
| 500 | =131 | =140 |
| 600 | =231 | =240 |
| 671 | =302 | =311 |
|  |  |  |







**Example:** Find out the mean deviation from mean and median from the following series.



|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Age in years | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 |
| No. of persons | 5 | 8 | 15 | 16 | 6 |

Also compute co-efficient of mean deviation.

**Solution: Calculation of mean and M.D. from mean**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Age in years** | **Mid value** | **No. of persons**  |  |  |  |  |
| 0-10 | 5 | 5 | -20 | -100 | 22 | 110 |
| 10-20 | 15 | 8 | -10 | -80 | 12 | 96 |
| 20-30 | 25 | 15 | 0 | 0 | 2 | 30 |
| 30-40 | 35 | 16 | 10 | 160 | 8 | 128 |
| 40-50 | 45 | 6 | 20 | 120 | 18 | 108 |
|  |  |  |  |  |  |  |

We know that







**Calculation of median and M.D. from median**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Age in years** | **Mid value** | **No. of persons**  | **c.f** |  |  |
| 0-10 | 5 | 5 | 5 | 23 | 115 |
| 10-20 | 15 | 8 | 13 | 13 | 104 |
| 20-30 | 25 | 15 | 28 | 3 | 45 |
| 30-40 | 35 | 16 | 44 | 7 | 112 |
| 40-50 | 45 | 6 | 50 | 17 | 102 |
|  |  |  |  |  |  |

We have



The cumulative frequency just greater than 25 is 28 and is corresponding class 20-30 is the median class.









**Merits and Demerits of mean deviation:**

**Merits:**

1. It is simple to understand and easy to compute.

2. It is rigidly defined.

3. It is based on all items of the series.

4. It is not much affected by the fluctuations of sampling.

5. It is less affected by the extreme items.

6. It is flexible, because it can be calculated from any average.

7. It is better measure of comparison.

**Demerits:**

1. It is not a very accurate measure of dispersion.

2. It is not suitable for further mathematical calculation.

3. It is rarely used. It is not as popular as standard deviation.

4. Algebraic positive and negative signs are ignored. It is mathematically unsound and illogical.

**Standard Deviation:**

Karl Pearson introduced the concept of standard deviation in 1893. It is the most important measure of dispersion and is widely used in many statistical formulae. Standard deviation is also called Root-Mean Square Deviation. The reason is that it is the square–root of the mean of the squared deviation from the arithmetic mean. It provides accurate result. Square of standard deviation is called Variance.

**Definition:**

It is defined as the positive square-root of the arithmetic mean of the Square of the deviations of the given observation from their arithmetic mean. The standard deviation is denoted by the Greek letter σ (sigma)

**Calculation of Standard deviation-Individual Series :**

There are two methods of calculating Standard deviation in an individual series.

a) Deviations taken from Actual mean

b) Deviation taken from Assumed mean (short cut method).

**Deviation taken from Actual mean:**

This method is adopted when the mean is a whole number.

**Steps:**

1. Find out the actual mean of the series.
2. Find out the deviation of each value from the mean 
3. Square the deviations and take the total of squared deviations 
4. Divide the total  by the number of observation n i.e., 
5. The square root of is standard deviation.

Thus, 

**Example:** Calculate the standard deviation from the following data. 14, 22, 9, 15, 20, 17, 12, 11

**Solution:**

|  |  |  |
| --- | --- | --- |
|  |  |  |
| 14 | -1 | 1 |
| 22 | 7 | 49 |
| 9 | -6 | 36 |
| 15 | 0 | 0 |
| 20 | 5 | 25 |
| 17 | 2 | 4 |
| 12 | -3 | 9 |
| 11 | -4 | 16 |
|  |  |  |

We have



