Conditions

the attendance at college of a group of 18 students was recorded for a 4 week period.

the numbers of students actually attending each of 16 classes are shown below.

18,16,18,15,18,17,14,17,17,16,17,18,17,18,18,16.calculate the mean and standard deviation of students attending the classes.

EXPRESS THE MEAN AS A PERCENTAGE OF THE 18 STUDENTS IN THE GROUP.

Solution

For calculating the mean we must use the formula of expectation for a discrete random value:

$$M(X) = \frac{1}{n} \sum_{i=1}^{n} x_i$$

where n = 16, x_i - the number of students actually attending each of n=16 classes from 1st to 16th.

$M(X) = \frac{1}{16}(18 + 16 + 18 + 15 + 18 + 17 + 14 + 17 + 17 + 16 + 17 + 18 + 17 + 18 + 18 + 16) = 16,875$

.

To find a standard deviation we must use the formula below:

$$\sigma = \sqrt{\frac{1}{n} \sum_{i=1}^{n} (x_i - M(X))^2}$$

These calculations are comfortably to do in Excel (here is a table):

i	x_i	$M(X)$	$x_i - M(X)$	$(x_i - M(X))^2$	σ
1	18		1,125	1,265625	
2	16		-0,875	0,765625	
3	18		1,125	1,265625	
4	15		-1,875	3,515625	
5	18		1,125	1,265625	
6	17		0,125	0,015625	
7	14	16,875	-2,875	8,265625	1,165922382
8	17		0,125	0,015625	
9	17		0,125	0,015625	
10	16		-0,875	0,765625	
11	17		0,125	0,015625	
12	18		1,125	1,265625	
13	17		0,125	0,015625	
14	18		1,125	1,265625	

15	18		1,125	1,265625	
16	16		-0,875	0,765625	

The standard deviation is 1,165922382. And this is $\frac{1,165922382}{18} \cdot 100\% \approx 6,477347\%$ of all group.

Answer:

The mean is $M(X) = 16,875$

The standard deviation is $\sigma = 1,165922382 = 6,477347\%$