STATS ASSIGNMENT 1

Problem Statement 1:

Your survey households in your area to find the avg rent they are paying. Find the std. deviation from the foll. data.

$1550, $1700, $900, $850, $1000, $950

Solution.

Here, $n = 6$

$$\text{mean}, \bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

$$= \frac{1550 + 1700 + 900 + 850 + 1000 + 950}{6}$$

$$= \frac{6950}{6} = 1158.33$$

$$\text{Variance} = s^2 = \sum_{i=1}^{n} \frac{(x_i - \bar{x})^2}{n-1}$$

($\bar{x}$: mean)

$$\text{Variance} = \frac{677083.28}{6} = 112847.21$$

Standard deviation, Std =

Square root of the variance

$$Std = \sqrt{\frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{n-1}}$$

$$Std = \sqrt{112847.21}$$

$$Std = \$\ 335.927$$

Problem Statement 2:

Find the variance for the following set of data representing trees in California (heights in feet):

3, 21, 98, 203, 17, 9

Solution:

Here, mean, $\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$

$$\text{mean} = \frac{3+21+98+203+17+9}{6}$$

$$= 58.5$$

$$\text{Variance} = S^2 = \frac{\sum_{i=1}^{n}(x_i - \bar{x})^2}{n-1}$$

$$= \frac{(3-58.5)^2 + (21-58.5)^2 + (98-58.5)^2 + (203-58.5)^2 + (17-58.5)^2 + (9-58.5)^2}{6}$$

$$\text{Variance} = 5183.25$$

Problem Statement 3: In a class of 100 students, 80 passed in all subjects, 10 failed in one subject, 7 failed in 2 subjects and 3 failed in 3 subjects. Find the probability distribution of the variable of number of subjects a student from the given class has failed in.

Solution - Total Students = 100

Students passed in all subjects = 80

Therefore,
- failed in 0 subject = 80
- failed in 1 subject = 10
- failed in 2 subjects = 7
- failed in 3 subjects = 3

Probability of →
- Failing in 0 subject = 80/100
- Failing in 1 Subject = 10/100
- Failing in 2 Subjects = 7/100
- Failing in 3 Subjects = 3/100

Expected no. of subjects a student has failed

$$= 0 * (80/100) + 1 * (10/100) + 2 * (7/100) + 3 (3/100)$$

$$= (0 + 10 + 14 + 9)/100 = \frac{33}{100} = 0.33$$