Problem 1:

You survey households in your area to find the average rent they are paying. Find the standard deviation from the following data:

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

Solution:

Step 1 – Calculation of Mean – (x1+x2+x3+x4+x5+x6)/n

(1550+1700+900+850+1000+950) / 6 = **1158.33**

Step 2 – Calculation of Variance –

$$s^2 = \frac{\sum (X - \bar{X})^2}{N - 1}$$

1550	392	153403
1700	542	293403
900	-258	66736
850	-308	95069
1000	-158	25069
950	-208	43403
1158.33		**677083.3**

Variance – 677083.3/(6-1) = **135416.7**

Step 3 – Calculation of Standard Deviation –

$$s = \sqrt{\frac{\sum(x - \bar{x})^2}{n - 1}}$$

√135416.7= 367.99
Therefore, Standard Deviation is **367.99**

Problem 2:

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

3, 21, 98, 203, 17, 9

Solution:

Step 1 – Calculation of Mean – (x1+x2+x3+x4+x5+x6)/n

(3+21+98+203+17+9) / 6 = **58.5**

Step 2 – Calculation of Variance –

3	-55.5	3080.25
21	-37.5	1406.25
98	39.5	1560.25
203	144.5	20880.25
17	-41.5	1722.25
9	-49.5	2450.25
58.5		**31099.5**

$$s^2 = \frac{\sum\left(X - \bar{X}\right)^2}{N - 1}$$

Variance – 31099.5/ (6-1) = **6219.9**

Problem 3:

In a class on 100 students, 80 students passed in all subjects, 10 failed in one subject, 7 failed in two subjects and 3 failed in three subjects. Find the probability distribution of the variable for number of subjects a student from the given class has failed in.

Solution:

The probability of failing in 0 subjects, P(X=0) =80/100 =0.8
The probability of failing in 1 subjects, P(X=1) =10/100 = 0.1
The probability of failing in 2 subjects, P(X=2) =7/100 = 0.07
The probability of failing in 3 subjects, P(X=3) = 3/100 = 0.03
The probability distribution can be shown as:

X	0	1	2	3
P(X)	0.8	0.1	0.07	0.03