ASSIGNMENT 3

CS21BTECH11020

1 Example 14 (Statistics)

1.1. Find the mode of the following marks (out of 10) obtained by 20 students.

4	6	5	9	3	2	7	7	6	5	4	9	10	10	3	4	7	6	9	9

TABLE 1.1.1

Solution: Since we know
mode is the value that appears most often in a set of data values.

We can also write,
If **X** is a discrete random variable, the *mode* is the value x (i.e, $\mathbf{X}= x$) at which the probability mass function ($\mathbf{P_X}(\mathbf{X}= x)$) takes its maximum value.

Taking Data from Table 1.1.1,
Let the marks obtained be the random variable (**X**) and Sample space be **S**.

$$\mathbf{S} = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10\} \tag{1.1.1}$$

Distribution of data is as follow:

Marks Obtained (out of 10) (X)	Frequency of Student	Probabilty Distribution (P(X=x))
0	**0**	**0**
1	**0**	**0**
2	**1**	**0.05**
3	**2**	**0.1**
4	**3**	**0.15**
5	**2**	**0.1**
6	**3**	**0.15**
7	**3**	**0.15**
8	**0**	**0**
9	**4**	**0.2**
10	**2**	**0.1**

TABLE 1.1.2

Plotting the data from Table 1.1.2

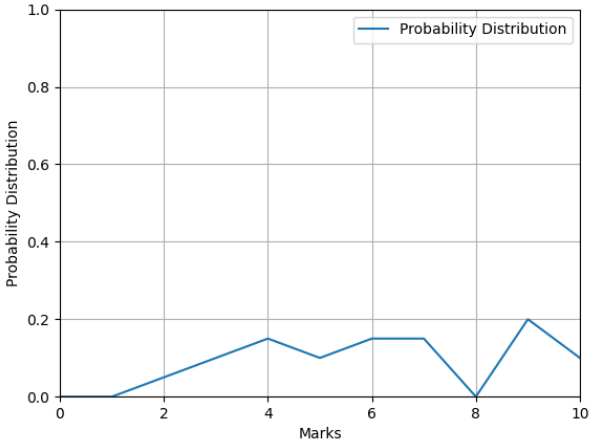

Fig. 1.1.1. From graph $x = 9$ has maximum value of probability mass function

Clearly, From Graph 1.1.1, $x = 9$ has maximum value of probability mass function.
Therefore,

$$mode = 9 \tag{1.1.2}$$