Assignment 3 : Example 9

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Question:

Consider the frequency distribution table (given below), which gives the weights of 38 students in a class.

(**i**) Find the probability that the weight of a student in a class lies in the interval $46-50$.

(**ii**) Give two events in this context, one having probability 0, and the other having probability 1.

TABLE I
DISTRIBUTION OF WEIGHTS OF STUDENTS IN A CLASS

Weight class	Number of students (frequency)
31 - 35	9
36 - 40	5
41 - 45	14
46 - 50	3
51 - 55	1
56 - 60	2
61 - 65	2
66 - 70	1
71 - 75	1

Solution:

(**i**) Let us define a random variable X, which represents the weight class of a student. The range of X and the corresponding weight class is given in the table below.

TABLE II
RANGE OF X MAPPED TO WEIGHT CLASSES FROM I

Weight class	X
31 - 35	1
36 - 40	2
41 - 45	3
46 - 50	4
51 - 55	5
56 - 60	6
61 - 65	7
66 - 70	8
71 - 75	9

$$\therefore P_X(4) = \frac{3}{38} = 0.079 \tag{1}$$

The probability that the weight of a student is in the weight class $(46-50)$ is $\underline{0.079}$.

(**ii**)
- The probability that the weight of a student is greater that 75 is 0.
- The probability that the weight of a student is in the interval $[31, 75]$ is 1.