AI1110 Assignment 4

Dondapati Chandrahas Reddy
AI21BTECH11010

CBSE 9th Probability

I. Example 6

Question:

A tyre manufacturing company kept a record of the distance covered before a tyre needed to be replaced. The table shows the results of 1000 cases.

Distance (in KM)	< 4000	4000 - 9000	9001 - 14000	> 14000
Frequency	20	210	325	445

If you buy a tyre of this company, what is the probability that :
(i) it will need to be replaced before it has covered 4000 km?
(ii) it will last more than 9000 km?
(iii) it will need to be replaced after it has covered somewhere between 4000 km and 14000 km?

Solution:

Let X = the distance covered by a tyre before replacement.

$$\text{(i) } P(X < 4000) = \frac{20}{1000} = 0.02 \tag{1}$$

$$\text{(ii) } P(X > 9000) = \frac{325}{1000} + \frac{445}{1000} = 0.77 \tag{2}$$

$$\text{(iii) } P(4000 \leq X \leq 14000) = \frac{210}{1000} + \frac{325}{1000} \tag{3}$$

$$= 0.535 \tag{4}$$

The python code `codes/example_6.py` produces a theoritical distribution