

AI1110 Assignment 4

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 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.

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

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

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

$$= 0.535 \quad (4)$$

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