Sri Lanka Institute of Information Technology

Lab Submission
Lab sheet No - 06

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Probability and Statistics - IT2120

B.Sc. (Hons) in Information Technology

Exercise

1. An IT company claims that their newly developed learning platform improves student performance in online tests. According to previous data, 85% of students who used the platform passed their online tests. A batch of 50 students is selected at random who have completed the course using this platform. Let X denote the number of students who passed the test out of 50 students.

    i. What is the distribution of X?

    ```
    > # Question 01
    > # i)
    > n <- 50
    > p <- 0.85
    ```

    ii. What is the probability that at least 47 students passed the test?

    ```
    > # ii)
    > 1 - pbinom(46, size=n, prob=p, lower.tail = TRUE)
    [1] 0.04604658
    ```

2. A call center receives an average of 12 customer calls per hour.

    i. What is the random variable (X) for the problem?

    ```
    > # Question 02
    > # i)
    > # x = number of calls per hour
    ```

    ii. What is the distribution of X?

    ```
    > # ii)
    > # x ~ Poisson(Lamda = 12)
    ```

    iii. What is the probability that exactly 15 calls are received in an hour?

    ```
    > # iii)
    > lambda <- 12
    > p_exactly_15 <- dpois(15, lambda)
    > print(p_exactly_15)
    [1] 0.07239112
    ```