Sri Lanka Institute of Information Technology

Lab Submission
Lab sheet No.06

IT24100861

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Probability and Statistics | IT2120

B.Sc. (Hons) in Information Technology

01. 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?

Answer: X ~ Binomial (n = 50, p = 0.85) --(Distribution)

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

```
#ii.
p_at_least_47 <- sum(dbinom(47:50, size=50, prob=0.85))#Probability that at least 47 students passed
p_at_least_47
```

```
> p_at_least_47 <- sum(dbinom(47:50, size=50, prob=0.85))#Probability that at least 47 students passed
> p_at_least_47
[1] 0.04604658
```

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

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

Answer: Random variable: X = number of calls per hour

ii. What is the distribution of X?

Answer: Distribution- X ~ Poisson (lambda = 12)

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

```
# iii.
p_exact_15 <- dpois(15, lambda=12)
p_exact_15
```

```
> p_exact_15 <- dpois(15, lambda=12)
> p_exact_15
[1] 0.07239112
```

```
> setwd("C:\\Users\\aaa\\OneDrive\\Desktop\\IT24100861 (1)")
> # (Q1)
>
> # i.
> #Answer:X ~ Binomial(n = 50, p = 0.85)--(Distribution)
>
> #ii.
> p_at_least_47 <- sum(dbinom(47:50, size=50, prob=0.85))#Probability that at least 47 students passed
> p_at_least_47
[1] 0.04604658
> # (Q2)
> # i. Random variable: X = number of calls per hour
>
> # ii. Distribution: X ~ Poisson(lambda = 12)
>
> # iii.
> p_exact_15 <- dpois(15, lambda=12)
> p_exact_15
[1] 0.07239112
```