

Sri Lanka Institute of Information Technology



Lab Submission
Lab 06

IT24100024

Mayureshan Parameswaran

Probability and Statistics | IT2120

B.Sc. (Hons) in Information Technology

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

```
# Parameters
n <- 50      # number of students
p <- 0.85    # probability of passing

# (ii) Probability that at least 47 students passed
1 - pbinom(46, size=n, prob=p)
```

```
> # Parameters
> n <- 50      # number of students
> p <- 0.85    # probability of passing
> # (ii) Probability that at least 47 students passed
> 1 - pbinom(46, size=n, prob=p)
[1] 0.04604658
```

2. A call center receives an average of 12 customer calls per hour.
- What is the random variable (X) for the problem?
 - What is the distribution of X?
 - What is the probability that exactly 15 calls are received in an hour?

```
# Parameters
lambda <- 12 # average calls per hour

# (i) Random variable
# X = number of calls received in one hour

# (ii) Distribution
# X ~ Poisson(lambda=12)

# (iii) Probability that exactly 15 calls are received
dpois(15, lambda=lambda)|

> # Parameters
> lambda <- 12 # average calls per hour
>
> # (i) Random variable
> # X = number of calls received in one hour
>
> # (ii) Distribution
> # X ~ Poisson(lambda=12)
>
> # (iii) Probability that exactly 15 calls are received
> dpois(15, lambda=lambda)
[1] 0.07239112
```