

# IT2120- Probability and Statistics

## Lab Sheet 07

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### **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  $X$ ?
- ii. What is the probability that at least 47 students passed the test?

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

- i. What is the random variable ( $X$ ) for the problem?
- ii. What is the distribution of  $X$ ?
- iii. What is the probability that exactly 15 calls are received in an hour?

Environment	History	Connections	Tutorial
   Import Dataset ▾  160 MiB ▾ 			
R ▾   Global Environment ▾ <div> <input type="text"/> </div>			
Values			
lambda	12		
n	50		
p	0.85		

```

> setwd("C:\\Users\\sesal\\OneDrive\\Desktop\\IT24102543_06")
> getwd()
[1] "C:/Users/sesal/OneDrive/Desktop/IT24102543_06"
> #Question 1
>
> #Part 1
> #Binomial Distribution
> n <- 50
> p <- 0.85
> #Part 2
> #P(X >= 47) = 1-P(x <= 46)
> 1 - pbinom(46, n, p, lower.tail = TRUE)
[1] 0.04604658
> #pbinom(46, n, p, lower.tail = FALSE)
> #Question 2
>
> #Part 1
> #Number of calls a call center recieves per hour
>
> #Part 2
> #Poisson Distribution
> #Lambda = 12
>
> #Part 3
> lambda <- 12
> dpois(15,lambda)
[1] 0.07239112
> |

```