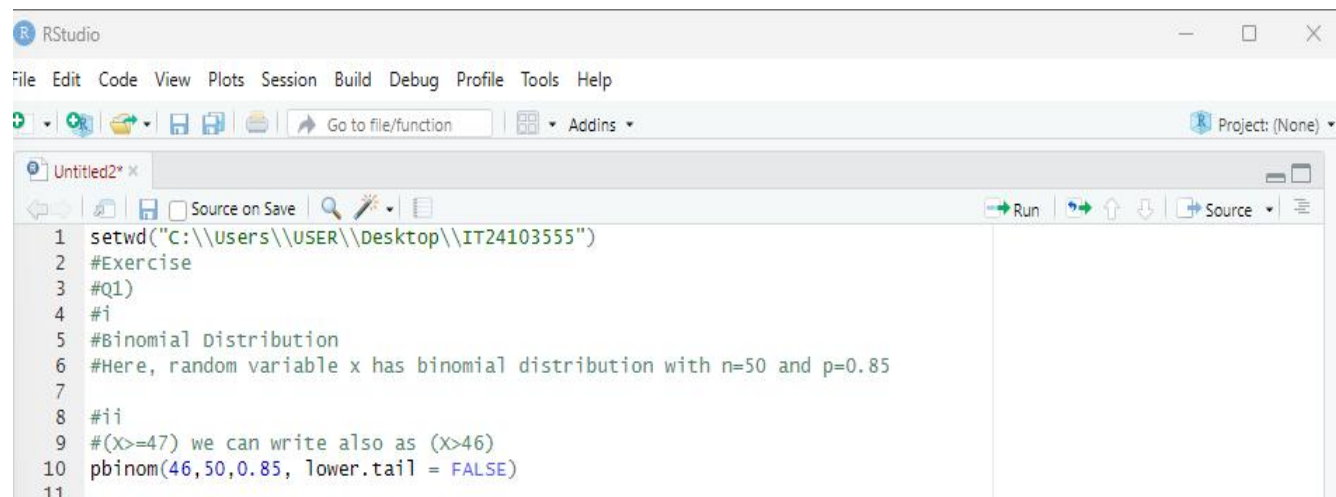


IT2120 – Probability and Statistics

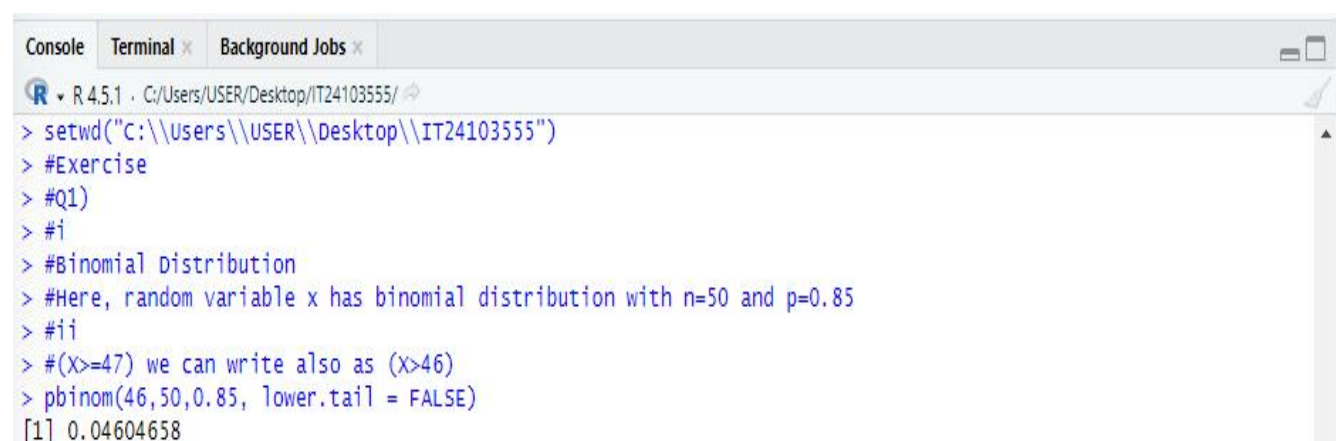
IT24103555

Senan R. A. D. T

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?



```
1 setwd("C:\\Users\\USER\\Desktop\\IT24103555")
2 #Exercise
3 #Q1)
4 #i
5 #Binomial Distribution
6 #Here, random variable x has binomial distribution with n=50 and p=0.85
7
8 #ii
9 #(X>=47) we can write also as (X>46)
10 pbinom(46,50,0.85, lower.tail = FALSE)
11
```



```
R 4.5.1 • C:/Users/USER/Desktop/IT24103555/
> setwd("C:\\Users\\USER\\Desktop\\IT24103555")
> #Exercise
> #Q1)
> #i
> #Binomial Distribution
> #Here, random variable x has binomial distribution with n=50 and p=0.85
> #ii
> #(X>=47) we can write also as (X>46)
> pbinom(46,50,0.85, lower.tail = FALSE)
[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?

```
11
12 #Q2)
13 #i
14 #number of customer calls received by the call center in a given hour.
15
16 #ii
17 #Poisson distribution
18 #Here, random variable x has poisson distribution with lambda=12
19
20 #iii
21 #(X=15)
22 dpois(15,12)
```

```
> #Q2)
> #i
> #number of customer calls received by the call center in a given hour.
> #ii
> #Poisson distribution
> #Here, random variable x has poisson distribution with lambda=12
> #iii
> #(X=15)
> dpois(15,12)
[1] 0.07239112
>
```