Sri Lanka Institute of Information Technology

Lab Submission
<Lab sheet - 06>

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Probability & Statistics | IT2120

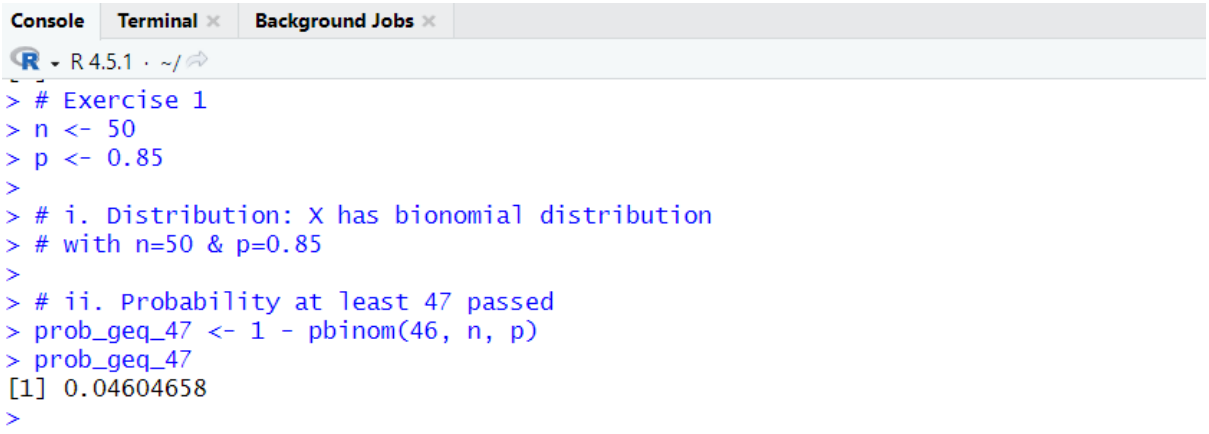
B.Sc. (Hons) in Information Technology

Exercise 1

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?



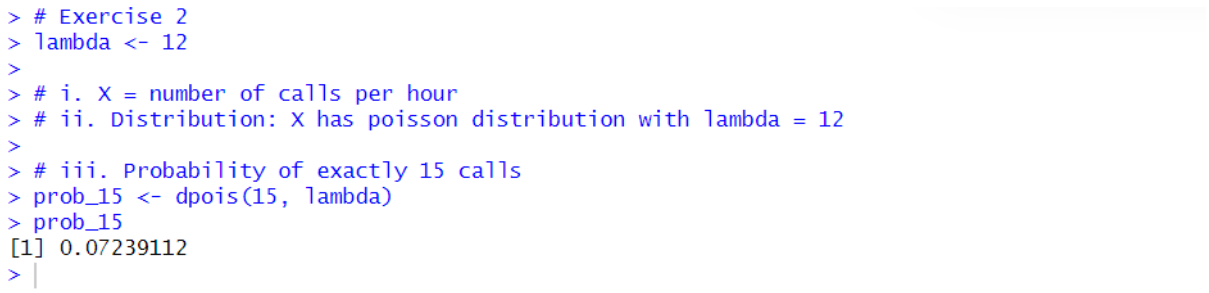
Exercise 2

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?



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```r
# Exercise 1
n <- 50
p <- 0.85

# i. Distribution: X has bionomial distribution
# with n=50 & p=0.85

# ii. Probability at least 47 passed
prob_geq_47 <- 1 - pbinom(46, n, p)
prob_geq_47


# Exercise 2
lambda <- 12

# i. X = number of calls per hour
# ii. Distribution: X has poisson distribution with lambda = 12

# iii. Probability of exactly 15 calls
prob_15 <- dpois(15, lambda)
prob_15

```