

Sri Lanka Institute of Information Technology



Lab Submission
Lab sheet No 07

IT24102615

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Probability and Statistics | IT2120

B.Sc. (Hons) in Information Technology

Exercise

Instructions: Create a folder in your desktop with your registration number (Eg: "IT."). You need to save the R script file and take screenshots of the command prompt with answers and save it in a word document inside the folder. Save both R script file and word document with your registration number (Eg: "IT."). After you finish the exercise, zip the folder and upload the zip file to the submission link.

1. A train arrives at a station uniformly between 8:00 a.m. and 8:40 a.m. Let the random variable X represent the number of minutes the train arrives after 8:00 a.m. What is the probability that the train arrives between 8:10 a.m. and 8:25 a.m.?

```
IT24102615.r x  Untitled1* x
Source on Save  Run  Source
1 getwd()
2
3 setwd("C:\\Users\\ASUS\\Desktop\\Lab_07_PS\\IT24102615")
4
5 ##Exercises
6 #1)
7 #Uniform Distribution
8 punif(25, min=0, max=40, lower.tail=TRUE) - punif(10, min=0, max=40, lower.tail=TRUE)
9
```

```
Console  Terminal x  Background Jobs x
R 4.5.1 · C:/Users/ASUS/Desktop/Lab_07_PS/IT24102615/
> getwd()
[1] "C:/Users/ASUS/Downloads"
> setwd("C:\\Users\\ASUS\\Desktop\\Lab_07_PS\\IT24102615")
> ##Exercises
> #1)
> #Uniform Distribution
> punif(25, min=0, max=40, lower.tail=TRUE) - punif(10, min=0, max=40, lower.tail=TRUE)
[1] 0.375
```

2. The time (in hours) to complete a software update is exponentially distributed with rate $\lambda = 1/3$. Find the probability that an update will take at most 2 hours.

```
9
10 #2)
11 #Exponential Distribution
12 pexp(2, rate=1/3, lower.tail=TRUE)
13
```

```
> #2)
> #Exponential Distribution
> pexp(2, rate=1/3, lower.tail=TRUE)
[1] 0.4865829
```

3. Suppose IQ scores are normally distributed with a mean of 100 and a standard deviation of 15.

i. What is the probability that a randomly selected person has an IQ above 130?

```
14 #3)
15 #Normal Distribution
16 #i)
17 pnorm(130, mean=100, sd=15, lower.tail=FALSE)
18
```

```
> #3)
> #Normal Distribution
> #i)
> pnorm(130, mean=100, sd=15, lower.tail=FALSE)
[1] 0.02275013
```

ii. What IQ score represents the 95th percentile?

```
18
19 #ii)
20 qnorm(0.95, mean=100, sd=15, lower.tail=TRUE)
21 |
```

21:1 (Top Level) ↕

R Script ↕

```
> #ii)
> qnorm(0.95, mean=100, sd=15, lower.tail=TRUE)
[1] 124.6728
> |
```