

Sri Lanka Institute of Information Technology



Lab Submission
Lab sheet No 7

IT24101551

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IT2120 - Probability and Statistics

B.Sc. (Hons) in Information Technology

Exercise

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.?

```
IT24101551.R* x
Source on Save
46 ## -----
47 ## Exercise
48
49
50 ## Question 1
51 # Uniform Distribution
52 # Using punif() function for uniform distribution
53
54 punif(25, min=0, max=40) - punif(10, min=0, max=40)
55
```

```
R 4.5.1 · C:/Users/thiya/OneDrive/Desktop/IT24101551/
> ## Exercise
>
>
> ## Question 1
> # Uniform Distribution
> # Using punif() function for uniform distribution
> punif(25, min=0, max=40) - punif(10, min=0, max=40)
[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.

```
56 ## Question 2
57 # Exponential Distribution
58 # Using pexp() function for exponential distribution
59
60 pexp(2, rate=1/3)
61
```

```
> ## Question 2
> # Exponential Distribution
> # Using pexp() function for exponential distribution
>
> pexp(2, rate=1/3)
[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?

```
62 ## Question 3
63 # Normal Distribution
64 # i. Probability IQ > 130
65 1 - pnorm(130, mean=100, sd=15)
66
```

```
> ## Question 3
> # Normal Distribution
> # i. Probability IQ > 130
> 1 - pnorm(130, mean=100, sd=15)
[1] 0.02275013
>
```

ii. What IQ score represents the 95th percentile?

```
67 # ii. 95th percentile IQ score
68 qnorm(0.95, mean=100, sd=15)
69
```

```
> # ii. 95th percentile IQ score
> qnorm(0.95, mean=100, sd=15)
[1] 124.6728
```