

Sri Lanka Institute of Information Technology



Lab Submission
07

IT24102798

Sooriyabandara U.R.G.W.K.

Probability and Statistics | IT2120

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.?

```
5
6 # Question 01
7
8 punif(25, min = 0, max = 40, lower.tail = TRUE) - punif(10, min = 0, max = 40, lower.tail = TRUE)
9
```

```
>
> # Question 01
>
> 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.

```
10
11 # Question 02
12
13 pexp(2, rate = 1/3, lower.tail = TRUE)
14
```

```
>
> # Question 02
>
> 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?

```
15  
16 # Question 03  
17  
18 # (i)  
19  
20 pnorm(130, mean = 100, sd = 15, lower.tail = FALSE)  
21
```

```
>  
> # Question 03  
>  
> # (i)  
>  
> pnorm(130, mean = 100, sd = 15, lower.tail = FALSE)  
[1] 0.02275013  
>
```

ii. What IQ score represents the 95th percentile?

```
22  
23 # (ii)  
24  
25 qnorm(0.95, mean = 100, sd = 15, lower.tail = TRUE)  
26
```

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