Sri Lanka Institute of Information Technology

Lab Submission
<Lab sheet 07>

<IT24104201>

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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.?

Uniform Distribution

Random variable X follows a uniform distribution with a=0 and b=40.

```
2  #01
3  punif(25,min=0,max=40,lower.tail=TRUE) - punif(10,min=0,max=40,lower.tail=TRUE)
```

```
> #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 λ= 1/3. Find the probability that an update will take at most 2 hours.

```
5  #02
6  pexp(2,rate=1/3,lower.tail=TRUE)
```

```
> #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?

```
8  #03(i)
9  pnorm(130,mean=100,sd=15,lower.tail=FALSE)
```

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

ii. What IQ score represents the 95th percentile?

```
11  #03(ii)
12  qnorm(0.95,mean=100,sd=15)
```

```
> #03(ii)
> qnorm(0.95,mean=100,sd=15)
[1] 124.6728
```