Sri Lanka Institute of Information Technology

Lab Submission
07

IT24100710

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Probability and Statistics - IT2120

B.Sc. (Hons) in Information Technology

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.?

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

> 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.

```
pexp(2,rate=1/3,lower.tail=TRUE)

> 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?

```
pnorm(130,mean=100,sd=15,lower.tail=FALSE)

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

   ii. What IQ score represents the 95th percentile?

```
qnorm(0.95,mean=100,sd=15,lower.tail=TRUE)

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