Sri Lanka Institute of Information Technology

Lab Submission
<Lab sheet No 07>

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Probability and Statistics| IT2120

B.Sc. (Hons) in Information Technology

Exercise

```
setwd("C:\\Users\\nisal\\OneDrive - Sri Lanka Institute of Information Technology\\Desktop\\Y2S1_updated\\PS_Updated\\labs\\lab7")
getwd()
```

```
> setwd("C:\\Users\\nisal\\OneDrive - Sri Lanka Institute of Information Technology\\Desktop\\Y2S1_updated\\PS_Updated\\labs\\lab7")
> getwd()
[1] "C:/Users/nisal/OneDrive - Sri Lanka Institute of Information Technology/Desktop/Y2S1_updated/PS_Updated/labs/lab7"
>
```

Question 01

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.?

```
> ###Question 01
> #Uniform Distribution
> #Here,random variable X follows a uniform distribution with a=0 and b=40.
> punif(25,min=0,max=40,lower.tail=TRUE)-punif(10,min=0,max=40,lower.tail=TRUE)
[1] 0.375
```

Question 02

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.

```
> ###Question 02
> #Exponential Distribution
> #Here,random variable X has exponential distribution with lambda=0.34.
> pexp(2,rate=0.34,lower.tail=TRUE)
[1] 0.493383
```

Question 03

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

1)What is the probability that a randomly selected person has an IQ above 130?

2)What IQ score represents the 95th percentile?

```
> ###Question 03
> #NOrmal Distribution
> #Here, random variable X normal distribution with mean=100 and standard deviation=15
>
> #Part 1
> 1-pnorm(130,mean=100,sd=15,lower.tail=TRUE)
[1] 0.02275013
> pnorm(130,mean=100,sd=15,lower.tail=FALSE)
[1] 0.02275013
> #Part 2
> qnorm(0.95,mean=100,sd=15,lower.tail=TRUE)
[1] 124.6728
```