IT2120 - Probability and Statistics

Lab Sheet 07

IT24103586 – Herath H.M.T.P

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.?

```
setwd("C:\\Users\thisu\\OneDrive\\Desktop\\IT24103586")

#Exercise
#1)
punif(25,min=0,max=40,lower.tail = TRUE) - punif(10,min=0,max=40,lower.tail = TRUE)
```

```
> #Exercise
> #1)
> 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 $\lambda = \frac{1}{3}$. Find the probability that an update will take at most 2 hours.

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

```
> #2)
> 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?
   ii. What IQ score represents the 95th percentile?

```
#3)
#i)
1 - pnorm(130, mean = 100, sd = 15, lower.tail = TRUE)

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

```
> #3)
> #i)
> 1 - pnorm(130, mean = 100, sd = 15, lower.tail = TRUE)
[1] 0.02275013
>
> #ii)
> qnorm(0.95, mean = 100, sd = 15, lower.tail = TRUE)
[1] 124.6728
```