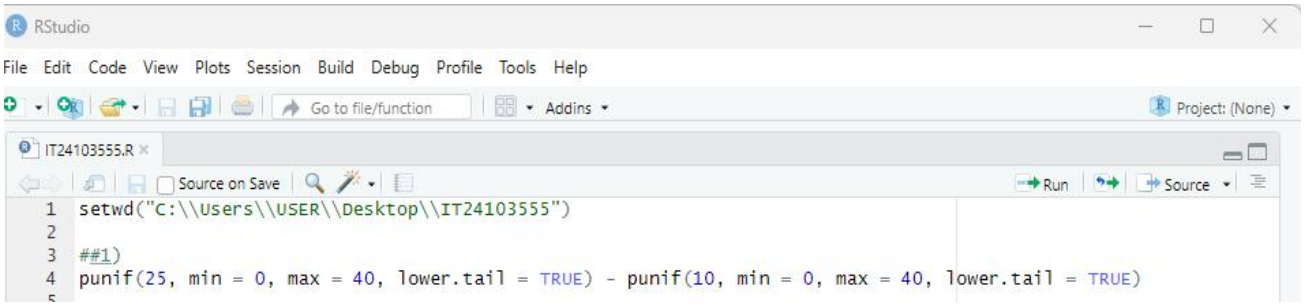
IT2120 - Probability and Statistics
IT24103555
Senan R. A. D. T

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.?




```
> ##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.

```
6 ##2)
7 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?

```
 9  ##3)
10
11  ##i
12  pnorm(130, mean = 100, sd = 15, lower.tail = FALSE)
13
14  ##ii
15  qnorm(0.95, mean = 100, sd = 15, lower.tail = TRUE)
```

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