

IT2120 - Probability and Statistics

Lab Sheet 07

It24100131

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1)

```
1 ##Setting the directory
2 setwd("C:\\Users\\Kaveesha\\Desktop\\it24100131 Lab 07")
3
4 # Q1 - Train arrival (Uniform Distribution)
5 # Random variable: X = minutes after 8:00 a.m. (Uniform(0, 40))
6 # We want P(10 <= X <= 25)
7 punif(25, min = 0, max = 40) - punif(10, min = 0, max = 40)
8
-
> ##Setting the directory
> setwd("C:\\Users\\Kaveesha\\Desktop\\it24100131 Lab 07")
>
> # Q1 - Train arrival (Uniform Distribution)
> # Random variable: X = minutes after 8:00 a.m. (Uniform(0, 40))
> # We want P(10 <= X <= 25)
> punif(25, min = 0, max = 40) - punif(10, min = 0, max = 40)
[1] 0.375
```

2)

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10 # Q2 - Software update time (Exponential Distribution)
11 # Random variable: X = time to complete update (hours)
12 # X ~ Exponential(rate =  $\lambda = 1/3$ )
13 # We want P(X <= 2)
14
15 pexp(2, rate = 1/3)

> # Q2 - Software update time (Exponential Distribution)
> # Random variable: X = time to complete update (hours)
> # X ~ Exponential(rate =  $\lambda = 1/3$ )
> # We want P(X <= 2)
>
> pexp(2, rate = 1/3)
[1] 0.4865829
```

3)

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```
17 # Q3 - IQ scores (Normal Distribution)
18 # Random variable: X = IQ score
19 #  $X \sim \text{Normal}(\text{mean} = 100, \text{sd} = 15)$ 
20 # (i) Probability IQ > 130
21 1 - pnorm(130, mean = 100, sd = 15)

> # Q3 - IQ scores (Normal Distribution)
> # Random variable: X = IQ score
> #  $X \sim \text{Normal}(\text{mean} = 100, \text{sd} = 15)$ 
> # (i) Probability IQ > 130
> 1 - pnorm(130, mean = 100, sd = 15)
[1] 0.02275013
```

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23 # (ii) 95th percentile IQ score
24 qnorm(0.95, mean = 100, sd = 15)

> # (ii) 95th percentile IQ score
> qnorm(0.95, mean = 100, sd = 15)
[1] 124.6728
```