SLIIT UNI
THE KNOWLEDGE UNIVERSITY

Faculty of Computing

Year 2 Semester 1 (2025)

IT2120 - Probability and Statistics Lab Sheet 07

Exercise

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.?

```
Source on Save
1  setwd("C:\\Users\\ip\\OneDrive\\Desktop")
2
3  # Question 1
4  #Uniform Distribution
5  a<-0
6  b<-40
7  p<-punif(25,min=a, max=b) - punif(10,min=a,max=b)
8  p
9
```

```
Console  Terminal  Background Jobs
R 4.5.1 · C:/Users/ip/OneDrive/Desktop/
> setwd("C:\\Users\\ip\\OneDrive\\Desktop")
> # Question 1
> #Uniform Distribution
> a<-0
> b<-40
> p<-punif(25,min=a, max=b) - punif(10,min=a,max=b)
> p
[1] 0.375
```

2. 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.

```
 9
10  #Question 2
11  #Exponential Distribution
12  lambda<-1/3
13  P2<-pexp(2,rate=lambda)
14  P2
15
```

```
> #Question 2
> #Exponential Distribution
> lambda<-1/3
> P2<-pexp(2,rate=lambda)
> P2
[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?

```
15
16  #Question 3
17  #i
18  # Probability IQ above 130
19  mu<-100
20  sigma<-15
21  P3_i<-1 - pnorm(130, mean = mu, sd = sigma)
22  P3_i
23
24  #ii
25  # 95th percentile IQ
26  IQ_95 <- qnorm(0.95, mean = mu, sd = sigma)
27  IQ_95
28
29
```

Console Terminal Background Jobs

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```
[1] 0.4809829
> #Question 3
> #i
> # Probability IQ above 130
> mu<-100
> sigma<-15
> P3_i<-1 - pnorm(130, mean = mu, sd = sigma)
> P3_i
[1] 0.02275013
> #ii
> # 95th percentile IQ
> IQ_95 <- qnorm(0.95, mean = mu, sd = sigma)
> IQ_95
[1] 124.6728
>
>
```

R · Global Environment

Values

a	0
b	40
IQ_95	124.672804404272
lambda	0.333333333333333
mu	100
p	0.375
P2	0.486582880967408
P3_i	0.0227501319481792
sigma	15