Sri Lanka Institute of Information Technology

<IT24103527>

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<Lab Sheet 7>

IT2120 | Probability & Statistics

Lab 7 ANSWERS

1.
```r
setwd("C:\\Users\\User\\Desktop\\IT24103527")
#01.)
# Calculate P(X <= 25) - P(X <= 10)
# This gives the probability of the interval [10, 25]
probability <- punif(25, min=0, max=40) - punif(10, min=0, max=40)
print(probability)
```

2.
```r
#02.)
# Calculate the probability that the time is less than or equal to 2 hours
probability <- pexp(2, rate =1/3)
print(probability)
```

3.
```r
#03.)
#i.)
# pnorm() with lower.tail = FALSE calculates P(X > x)
prob_above_130 <- pnorm(130, mean=100, sd=15, lower.tail = FALSE)
print(prob_above_130)

#ii.)
#qnorm() is the inverse of pnorm() and gives the value for a given probability
iq_95th_percentile <- qnorm(0.95, mean=100, sd=15)
print(iq_95th_percentile)
```

Console Output

```
> setwd("C:\\Users\\User\\Desktop\\IT24103527")
> #01.)
> # Calculate P(X <= 25) - P(X <= 10)
> # This gives the probability of the interval [10, 25]
> probability <- punif(25, min=0, max=40) - punif(10, min=0, max=40)
> print(probability)
[1] 0.375
> #02.)
> # Calculate the probability that the time is less than or equal to 2 hours
> probability <- pexp(2, rate =1/3)
> print(probability)
[1] 0.4865829
> #03.)
> #i.)
> # pnorm() with lower.tail = FALSE calculates P(X > x)
> prob_above_130 <- pnorm(130, mean=100, sd=15, lower.tail = FALSE)
> print(prob_above_130)
[1] 0.02275013
>
> #ii.)
> #qnorm() is the inverse of pnorm() and gives the value for a given probability
> iq_95th_percentile <- qnorm(0.95, mean=100, sd=15)
> print(iq_95th_percentile)
[1] 124.6728
```

Global Environment