Lab Sheet 07

IT24102732

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1.

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> setwd("C:\\sliit\\2nd 1 sem\\ps\\lab\\lab7.R")
>
> # Q1
> # 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.?
>
> # We want to find P(10 < X < 25), calculated as P(X <= 25) - P(X <= 10).
> punif(25, min = 0, max = 40) - punif(10, min = 0, max = 40)
[1] 0.375
```

```
> # Q2
> # 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.
>
> # We want to find P(X <= 2).
> pexp(2, rate = 1/3)
[1] 0.4865829
```

2.

3.

```
> # Q3
> # 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?
> # We want to find P(X > 130)
>
> pnorm(130, mean = 100, sd = 15, lower.tail = FALSE)
[1] 0.02275013
```

i)

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> # ii. What IQ score represents the 95th percentile ?
> # We need to find the value 'k' for which P(X <= k) = 0.95
>
> qnorm(0.95, mean = 100, sd = 15)
[1] 124.6728
```

ii)