IT24103558

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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.?

```
getwd()
setwd("C:\\Users\\Methasa\\Desktop\\IT24103558")

#Q1
punif(25, min=0, max=40) - punif(10, min=0, max=40)
```

```
> getwd()
[1] "C:/Users/Methasa/Desktop/IT24103558"
> setwd("C:\\Users\\Methasa\\Desktop\\IT24103558")
> #Q1
> punif(25, min=0, max=40) - punif(10, min=0, max=40)
[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.

```
#Q2
pexp(2, rate=1/3)
```

```
> #Q2
> pexp(2, rate=1/3)
[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?

```
#Q3
#part 1
1 - pnorm(130, mean=100, sd=15)

pnorm(130, mean=100, sd=15, lower.tail = FALSE)

#part 2
qnorm(0.95, mean=100, sd=15)
```

```
> 1 - pnorm(130, mean=100, sd=15)
[1] 0.02275013
>
> pnorm(130, mean=100, sd=15, lower.tail = FALSE)
[1] 0.02275013

> qnorm(0.95, mean=100, sd=15)
[1] 124.6728
```