IT24101966

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.?

```
setwd("D:\\IT24101966_PS_Lab_07")

#1 - Uniform Distribution
punif(25, min=0, max=40) - punif(10, min=0, max=40)
```

```
> setwd("D:\\IT24101966_PS_Lab_07")
> #1 - Uniform Distribution
> 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.

```
#2: Exponential Distribution
pexp(2, rate=1/3)
```

```
> #2: Exponential Distribution
> 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?

```
#3 part 1: Normal Distribution
1 - pnorm(130, mean=100, sd=15)

#3 part 2 95th Percentile
qnorm(0.95, mean=100, sd=15)
```

```
> #3 part 1: Normal Distribution
> 1 - pnorm(130, mean=100, sd=15)
[1] 0.02275013
> #3 part 2 95th Percentile
> qnorm(0.95, mean=100, sd=15)
[1] 124.6728
```