

IT24102383

PS lab 07

-
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.?

```
> # Problem 1
> punif(25, min=0, max=40) - punif(10, min=0, max=40) # returns 0.375
[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.

```
> # Problem 2
> pexp(2, rate = 1/3) # returns 1 - exp(-2/3)
[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?

```
> # Problem 3.i
> pnorm(130, mean = 100, sd = 15, lower.tail = FALSE)
[1] 0.02275013
> # Problem 3.ii
> qnorm(0.95, mean = 100, sd = 15) # ≈ 124.6728
[1] 124.6728
```