# Sri Lanka Institute of Information Technology



# Lab Submission
# 07

**IT24102160**

**Gangamini A.H.A.**

**Probability and Statistics - IT2120**

B.Sc. (Hons) in Information Technology

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\\User\\Desktop\\IT24102160")

## (1)
punif(15, min = 0, max = 40, lower.tail = TRUE)
```

```
> setwd("C:\\Users\\User\\Desktop\\IT24102160")
> punif(15, min = 0, max = 40, lower.tail = TRUE)
[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)
pexp(2, rate = 0.33, lower.tail = TRUE)
```

```
> pexp(2, rate = 0.33, lower.tail = TRUE)
[1] 0.4831487
```

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)
# (i)
1 - pnorm(130, mean = 100, sd = 15, lower.tail = TRUE)

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

```
> 1 - pnorm(130, mean = 100, sd = 15, lower.tail = TRUE)
[1] 0.02275013
> qnorm(0.95, mean=100, sd=15)
[1] 124.6728
```