

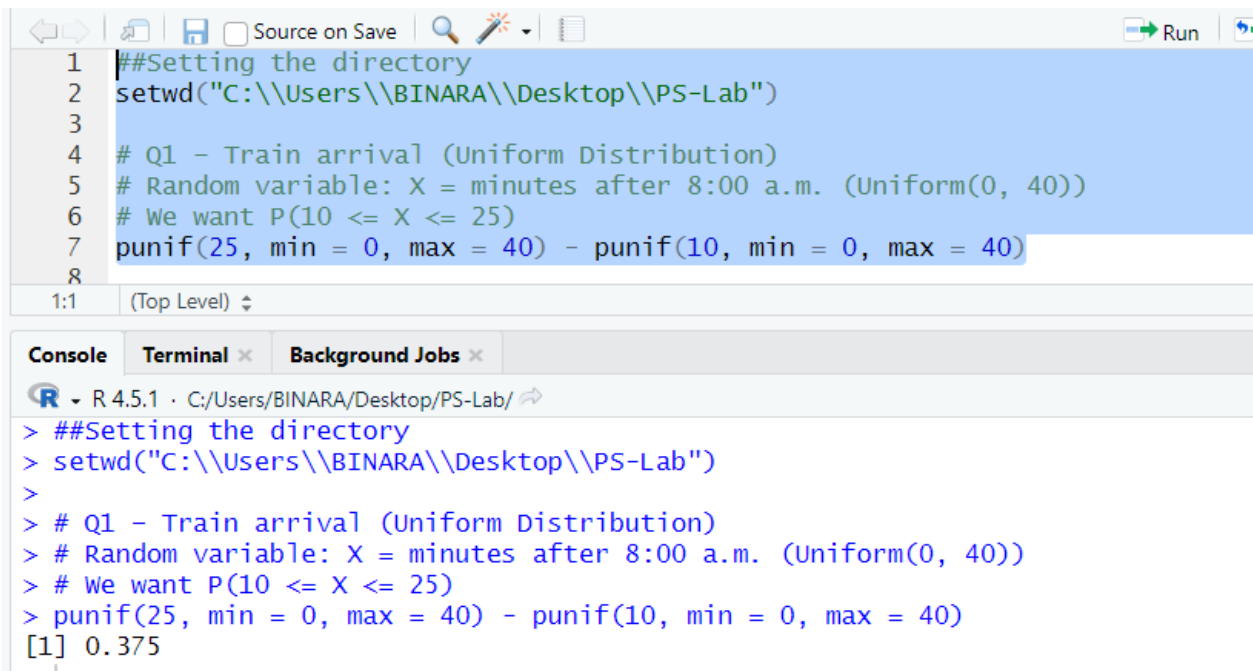
IT2120

Lab Sheet 07

IT24100227

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1)



The screenshot shows the R Studio interface. The top pane contains R code for a uniform distribution problem. The code sets the working directory to 'C:\\Users\\BINARA\\Desktop\\PS-Lab', defines a uniform distribution for train arrival times, and calculates the probability of a train arriving between 10 and 25 minutes after 8:00 a.m. The bottom pane shows the console output, which includes the same code and the result of the calculation: 0.375.

```
1 ##Setting the directory
2 setwd("C:\\Users\\BINARA\\Desktop\\PS-Lab")
3
4 # Q1 - Train arrival (Uniform Distribution)
5 # Random variable: X = minutes after 8:00 a.m. (Uniform(0, 40))
6 # We want P(10 <= X <= 25)
7 punif(25, min = 0, max = 40) - punif(10, min = 0, max = 40)
8
```

1:1 (Top Level) ⌵

Console **Terminal** **Background Jobs**

R 4.5.1 · C:/Users/BINARA/Desktop/PS-Lab/ ↗

```
> ##Setting the directory
> setwd("C:\\Users\\BINARA\\Desktop\\PS-Lab")
>
> # Q1 - Train arrival (Uniform Distribution)
> # Random variable: X = minutes after 8:00 a.m. (Uniform(0, 40))
> # We want P(10 <= X <= 25)
> punif(25, min = 0, max = 40) - punif(10, min = 0, max = 40)
[1] 0.375
```

2)

```
10 # Q2 - Software update time (Exponential Distribution)
11 # Random variable: X = time to complete update (hours)
12 # X ~ Exponential(rate =  $\lambda = 1/3$ )
13 # We want P(X <= 2)
14
15 pexp(2, rate = 1/3)
```

```
> # Q2 - Software update time (Exponential Distribution)
> # Random variable: X = time to complete update (hours)
> # X ~ Exponential(rate =  $\lambda = 1/3$ )
> # We want P(X <= 2)
>
> pexp(2, rate = 1/3)
[1] 0.4865829
```

```

17 # Q3 - IQ scores (Normal Distribution)
18 # Random variable: X = IQ score
19 # X ~ Normal(mean = 100, sd = 15)
20 # (i) Probability IQ > 130
21 1 - pnorm(130, mean = 100, sd = 15)

> # Q3 - IQ scores (Normal Distribution)
> # Random variable: X = IQ score
> # X ~ Normal(mean = 100, sd = 15)
> # (i) Probability IQ > 130
> 1 - pnorm(130, mean = 100, sd = 15)
[1] 0.02275013
3) 1.

```

```

23 # (ii) 95th percentile IQ score
24 qnorm(0.95, mean = 100, sd = 15)

> # (ii) 95th percentile IQ score
> qnorm(0.95, mean = 100, sd = 15)
[1] 124.6728
2.

```