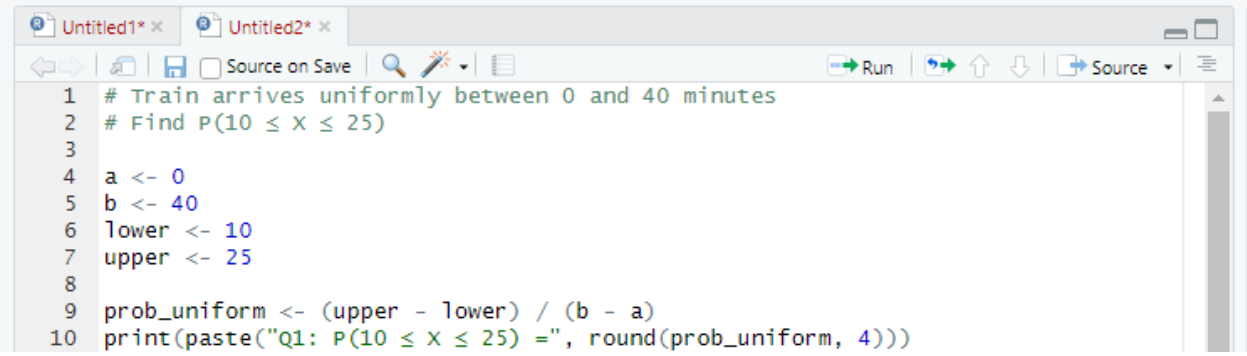
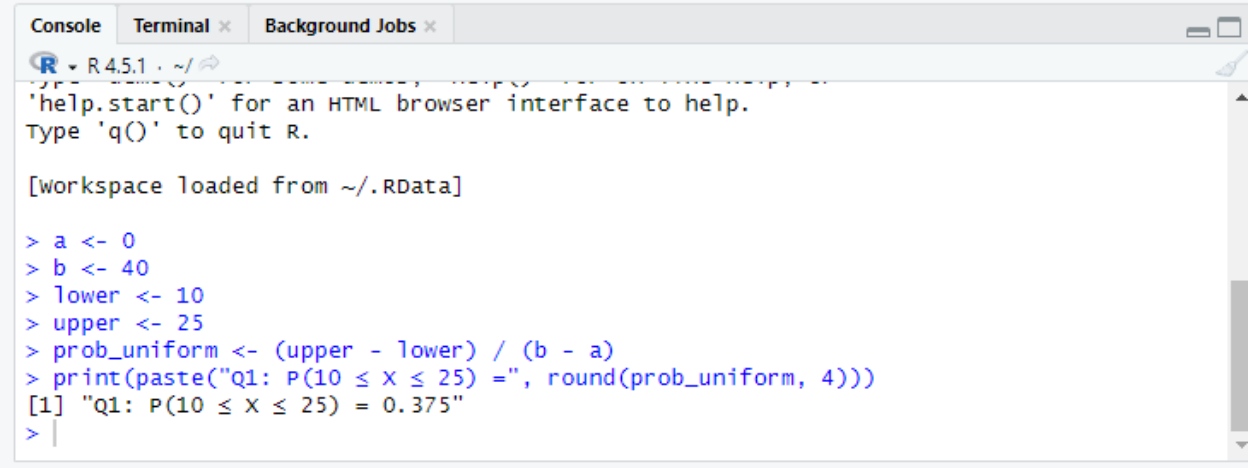
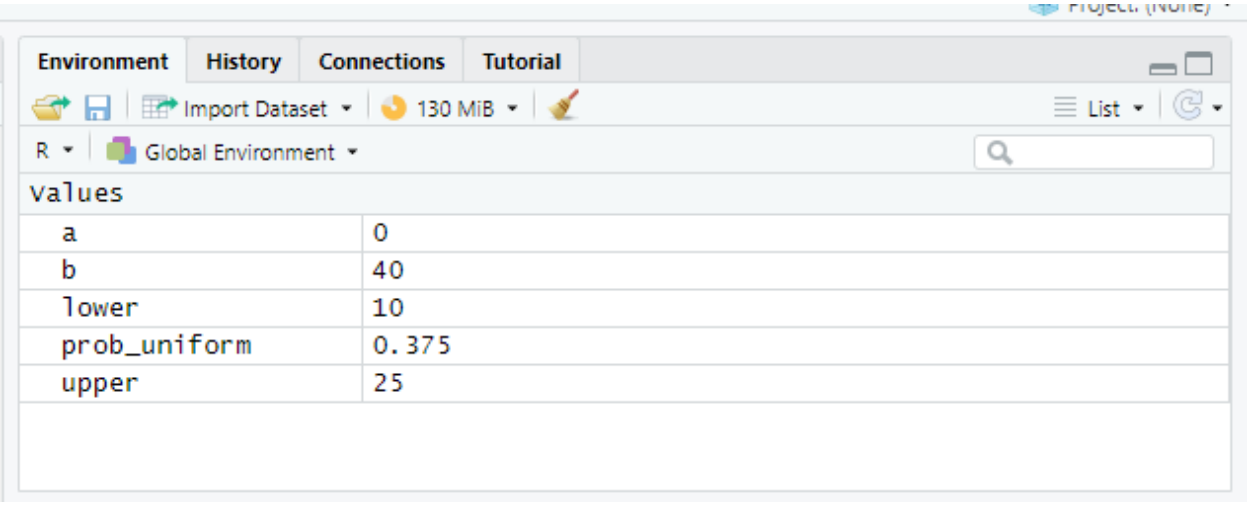
IT24104177 PS LAB 7

1.



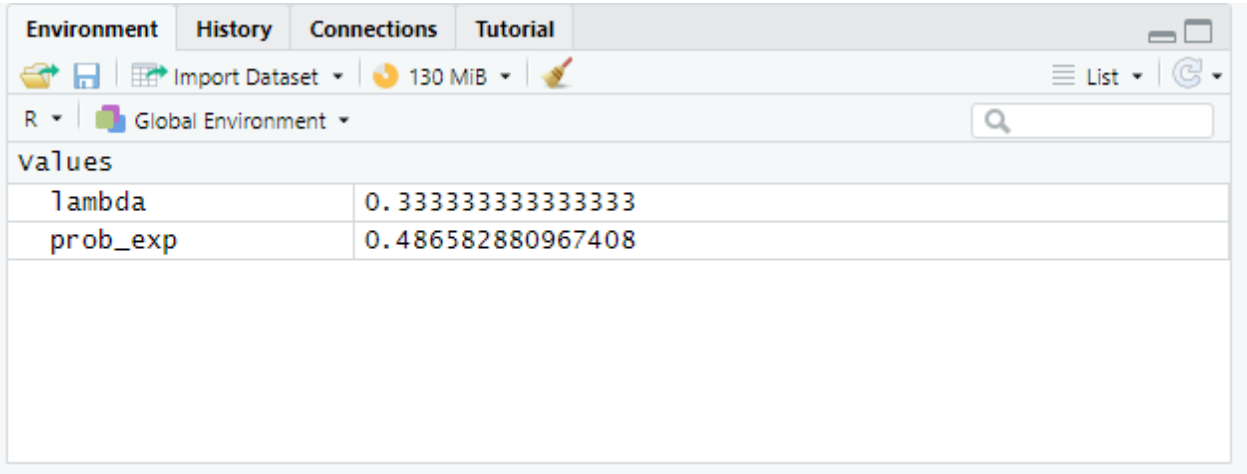




Q2.

```
11
12  ### Question 2: Exponential Distribution
13  # λ = 1/3 → mean = 3 hours
14  # Find P(X ≤ 2)
15
16  lambda <- 1/3
17  prob_exp <- pexp(2, rate = lambda)
18  print(paste("Q2: P(X ≤ 2) =", round(prob_exp, 4)))
19
```

```
> lambda <- 1/3
> prob_exp <- pexp(2, rate = lambda)
> print(paste("Q2: P(X ≤ 2) =", round(prob_exp, 4)))
[1] "Q2: P(X ≤ 2) = 0.4866"
>
```



Q3

```
19
20  ### Question 3: Normal Distribution
21  # Mean = 100, SD = 15
22
23  # i. P(X > 130)
24  mean_iq <- 100
25  sd_iq <- 15
26  prob_above_130 <- 1 - pnorm(130, mean = mean_iq, sd = sd_iq)
27  print(paste("Q3.i: P(IQ > 130) =", round(prob_above_130, 4)))
28
29  # ii. 95th percentile
30  iq_95th <- qnorm(0.95, mean = mean_iq, sd = sd_iq)
31  print(paste("Q3.ii: 95th Percentile IQ =", round(iq_95th, 2)))
32
```

```
> # i. P(X > 130)
> mean_iq <- 100
> sd_iq <- 15
> prob_above_130 <- 1 - pnorm(130, mean = mean_iq, sd = sd_iq)
> print(paste("Q3.i: P(IQ > 130) =", round(prob_above_130, 4)))
[1] "Q3.i: P(IQ > 130) = 0.0228"
> # ii. 95th percentile
> iq_95th <- qnorm(0.95, mean = mean_iq, sd = sd_iq)
> # ii. 95th percentile
> iq_95th <- qnorm(0.95, mean = mean_iq, sd = sd_iq)
> print(paste("Q3.ii: 95th Percentile IQ =", round(iq_95th, 2)))
[1] "Q3.ii: 95th Percentile IQ = 124.67"
```