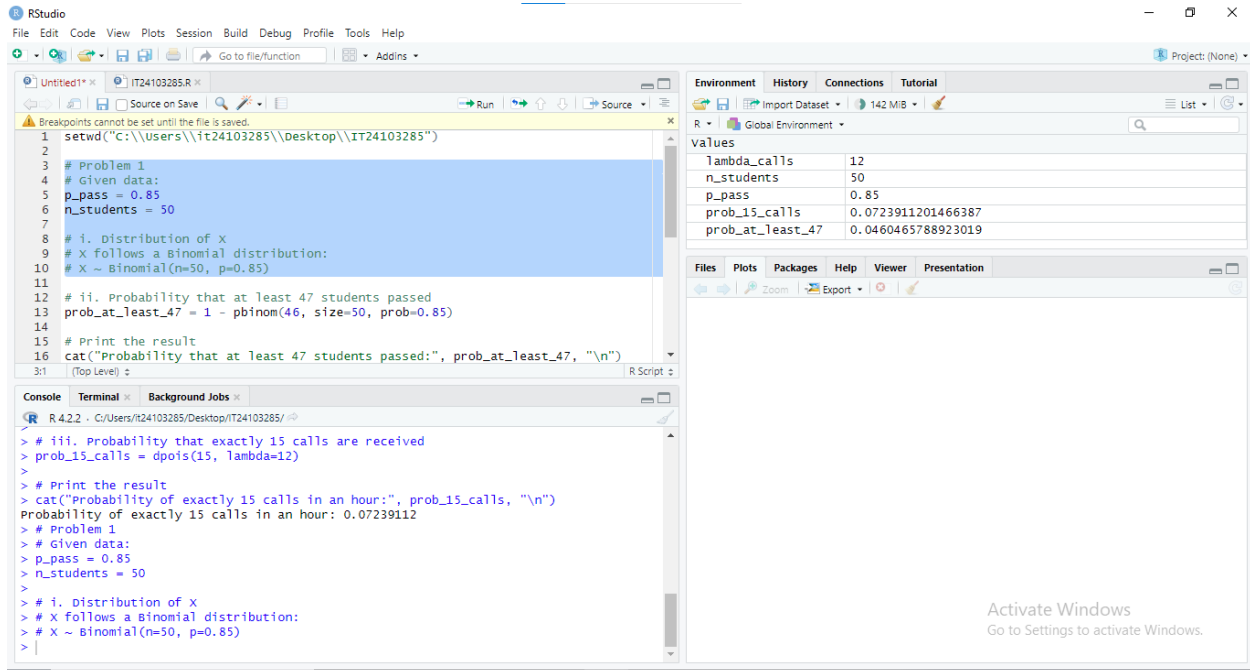


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## Lab Sheet 06

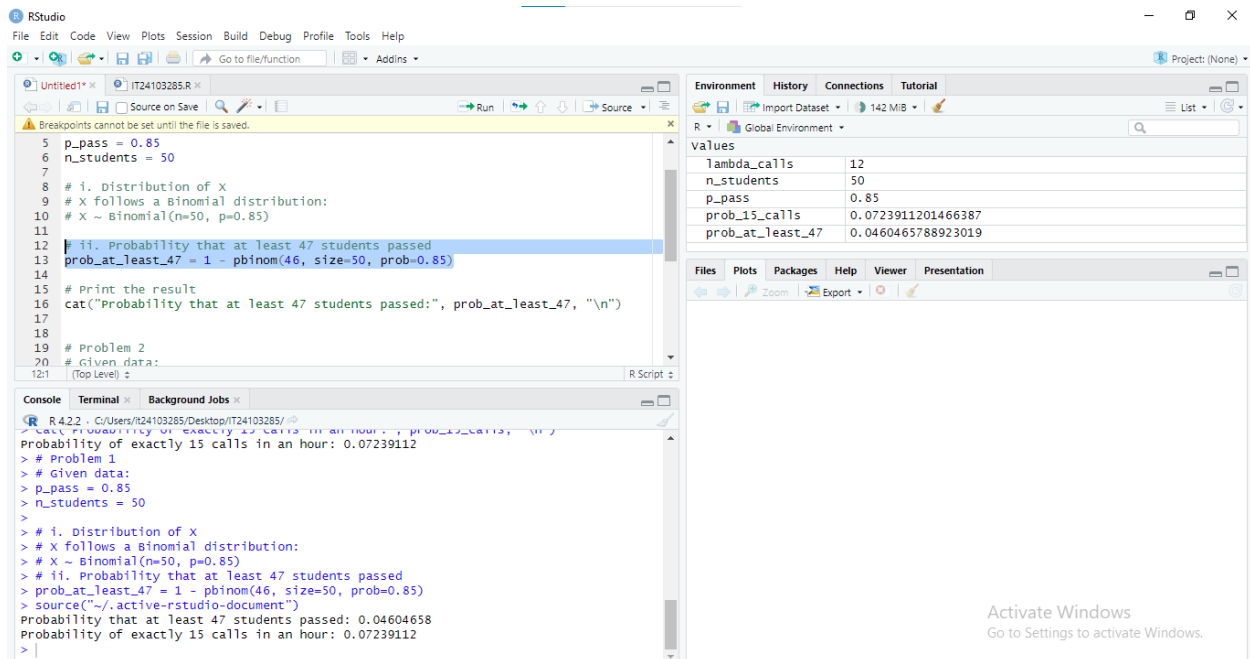


RStudio interface showing the first part of an R script. The script defines variables for a binomial distribution problem and calculates the probability of at least 47 students passing.

```
1 setwd("C:\\Users\\it24103285\\Desktop\\IT24103285")
2
3 # Problem 1
4 # Given data:
5 p_pass = 0.85
6 n_students = 50
7
8 # i. Distribution of X
9 # X follows a Binomial distribution:
10 # X ~ Binomial(n=50, p=0.85)
11
12 # ii. Probability that at least 47 students passed
13 prob_at_least_47 = 1 - pbinom(46, size=50, prob=0.85)
14
15 # Print the result
16 cat("Probability that at least 47 students passed:", prob_at_least_47, "\n")
17
```

The Environment pane shows the following values:

Variable	Value
lambda_calls	12
n_students	50
p_pass	0.85
prob_15_calls	0.0723911201466387
prob_at_least_47	0.0460465788923019



RStudio interface showing the second part of an R script. The script continues with calculations for a Poisson distribution and then sources the first part of the script.

```
18
19 # Problem 2
20 # Given data:
21
22 # i. Distribution of X
23 # X follows a Binomial distribution:
24 # X ~ Binomial(n=50, p=0.85)
25
26 # ii. Probability that at least 47 students passed
27 prob_at_least_47 = 1 - pbinom(46, size=50, prob=0.85)
28
29 # Print the result
30 cat("Probability that at least 47 students passed:", prob_at_least_47, "\n")
31
32 # Problem 1
33 # Given data:
34 p_pass = 0.85
35 n_students = 50
36
37 # i. Distribution of X
38 # X follows a Binomial distribution:
39 # X ~ Binomial(n=50, p=0.85)
40
41 # ii. Probability that at least 47 students passed
42 prob_at_least_47 = 1 - pbinom(46, size=50, prob=0.85)
43
44 # Print the result
45 cat("Probability that at least 47 students passed:", prob_at_least_47, "\n")
46
47 # Source the first part of the script
48 source("../.active-rstudio-document")
49
```

The Environment pane shows the following values:

Variable	Value
lambda_calls	12
n_students	50
p_pass	0.85
prob_15_calls	0.0723911201466387
prob_at_least_47	0.0460465788923019

RStudio

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Project: (None)

Environment History Connections Tutorial

R Global Environment

values

lambda_calls	12
n_students	50
p_pass	0.85
prob_15_calls	0.0723911201466387
prob_at_least_47	0.0460465788923019

Files Plots Packages Help Viewer Presentation

Zoom Export

```
9 # x follows a binomial distribution:
10 # X ~ Binomial(n=50, p=0.85)
11
12 # ii. Probability that at least 47 students passed
13 prob_at_least_47 = 1 - pbinom(46, size=50, prob=0.85)
14
15 # Print the result
16 cat("Probability that at least 47 students passed:", prob_at_least_47, "\n")
17
18
19 # Problem 2
20 # Given data:
21 lambda_calls = 12
22
23 # i. Random variable
24 # X = number of calls received in an hour
25
26 # ii. Distribution of X
27 # X follows a Poisson distribution:
28 # X ~ Poisson(lambda=12)
29
30 # iii. Probability that exactly 15 calls are received
31 prob_15_calls = dpois(15, lambda=12)
32
33 # Print the result
34 cat("Probability of exactly 15 calls in an hour:", prob_15_calls, "\n")
```

Console Terminal Background Jobs

R 4.2.2 - C:/Users/IT24103285/Desktop/IT24103285/

```
> # ii. Probability that at least 47 students passed
> prob_at_least_47 = 1 - pbinom(46, size=50, prob=0.85)
>
> # Print the result
> cat("Probability that at least 47 students passed:", prob_at_least_47, "\n")
Probability that at least 47 students passed: 0.04604658
> source("~/active-rstudio-document")
Probability that at least 47 students passed: 0.04604658
Probability of exactly 15 calls in an hour: 0.07239112
> # ii. Probability that at least 47 students passed
> prob_at_least_47 = 1 - pbinom(46, size=50, prob=0.85)
>
> # Print the result
> cat("Probability that at least 47 students passed:", prob_at_least_47, "\n")
Probability that at least 47 students passed: 0.04604658
>
```

Activate Windows  
Go to Settings to activate Windows.

RStudio

File Edit Code View Plots Session Build Debug Profile Tools Help

Go to file/function Addins

Project: (None)

Environment History Connections Tutorial

R Global Environment

values

lambda_calls	12
n_students	50
p_pass	0.85
prob_15_calls	0.0723911201466387
prob_at_least_47	0.0460465788923019

Files Plots Packages Help Viewer Presentation

Zoom Export

```
10 cat("Probability that at least 47 students passed:", prob_at_least_47, "\n")
11
12
13 # Problem 2
14 # Given data:
15 lambda_calls = 12
16
17 # i. Random variable
18 # X = number of calls received in an hour
19
20 # ii. Distribution of X
21 # X follows a Poisson distribution:
22 # X ~ Poisson(lambda=12)
23
24 # iii. Probability that exactly 15 calls are received
25 prob_15_calls = dpois(15, lambda=12)
26
27 # Print the result
28 cat("Probability of exactly 15 calls in an hour:", prob_15_calls, "\n")
```

Console Terminal Background Jobs

R 4.2.2 - C:/Users/IT24103285/Desktop/IT24103285/

```
> # Given data:
> lambda_calls = 12
>
> # i. Random variable
> # X = number of calls received in an hour
>
> # ii. Distribution of X
> # X follows a Poisson distribution:
> # X ~ Poisson(lambda=12)
>
> # iii. Probability that exactly 15 calls are received
> prob_15_calls = dpois(15, lambda=12)
>
> # Print the result
> cat("Probability of exactly 15 calls in an hour:", prob_15_calls, "\n")
Probability of exactly 15 calls in an hour: 0.07239112
```

Activate Windows  
Go to Settings to activate Windows.