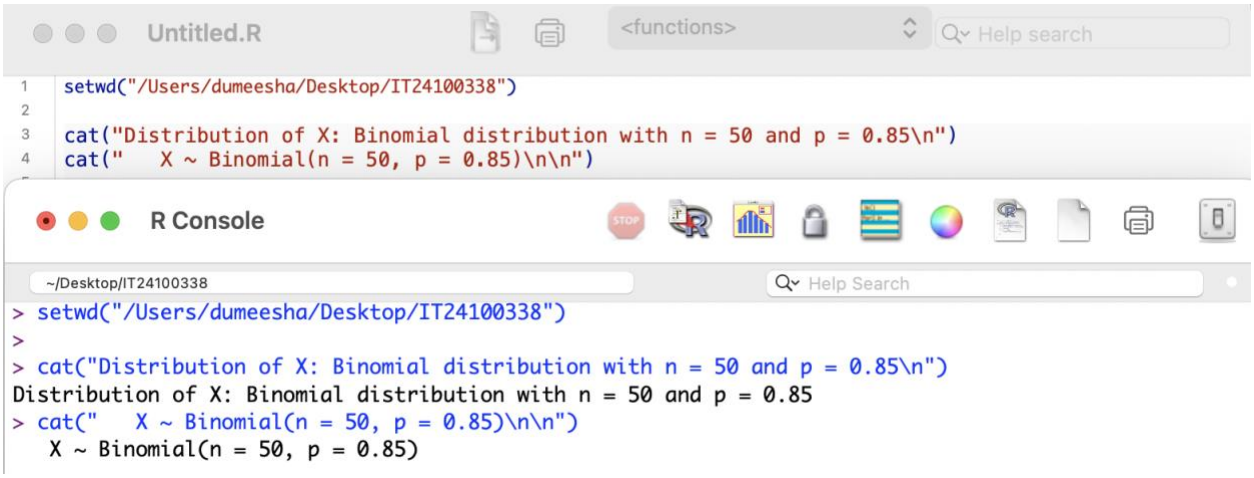
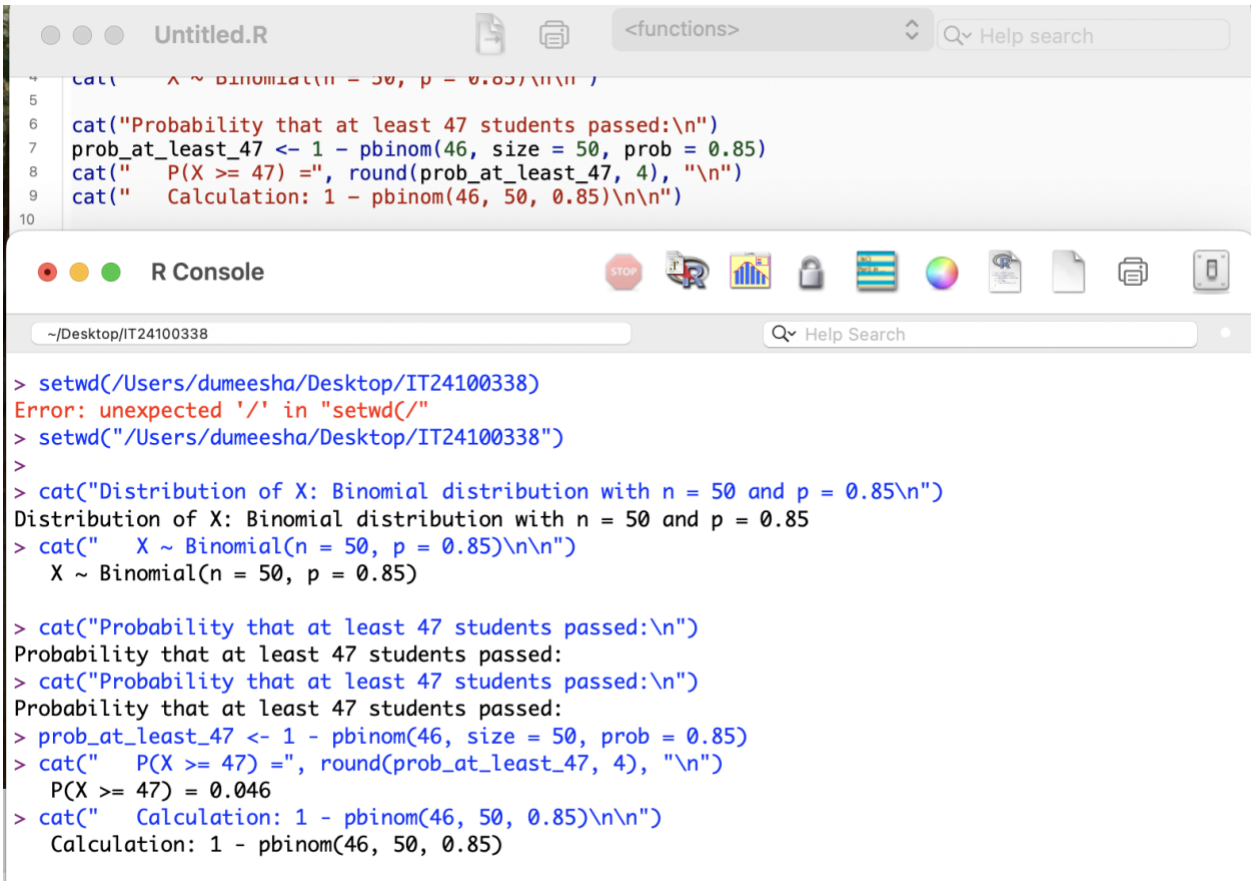
Exercise

1

i.

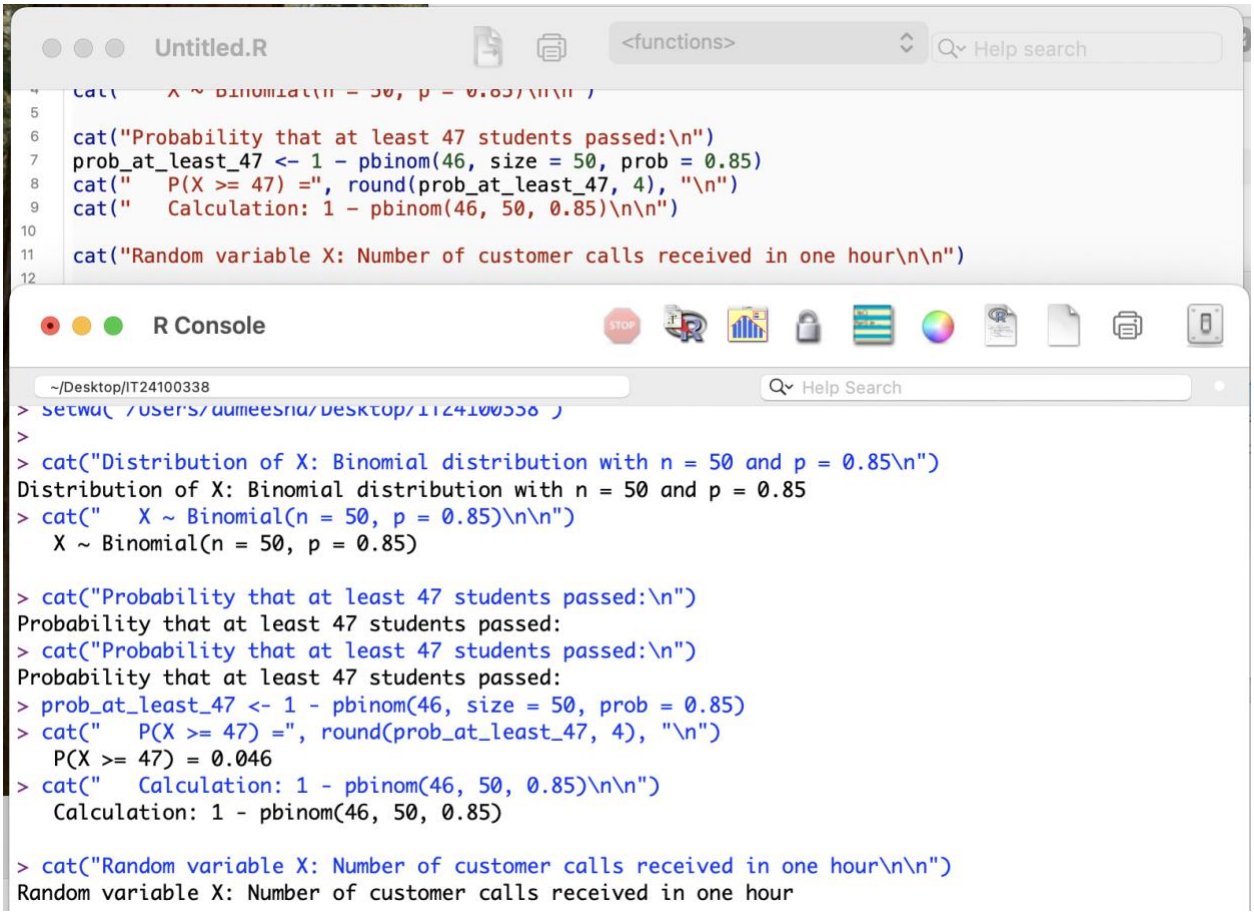


ii.

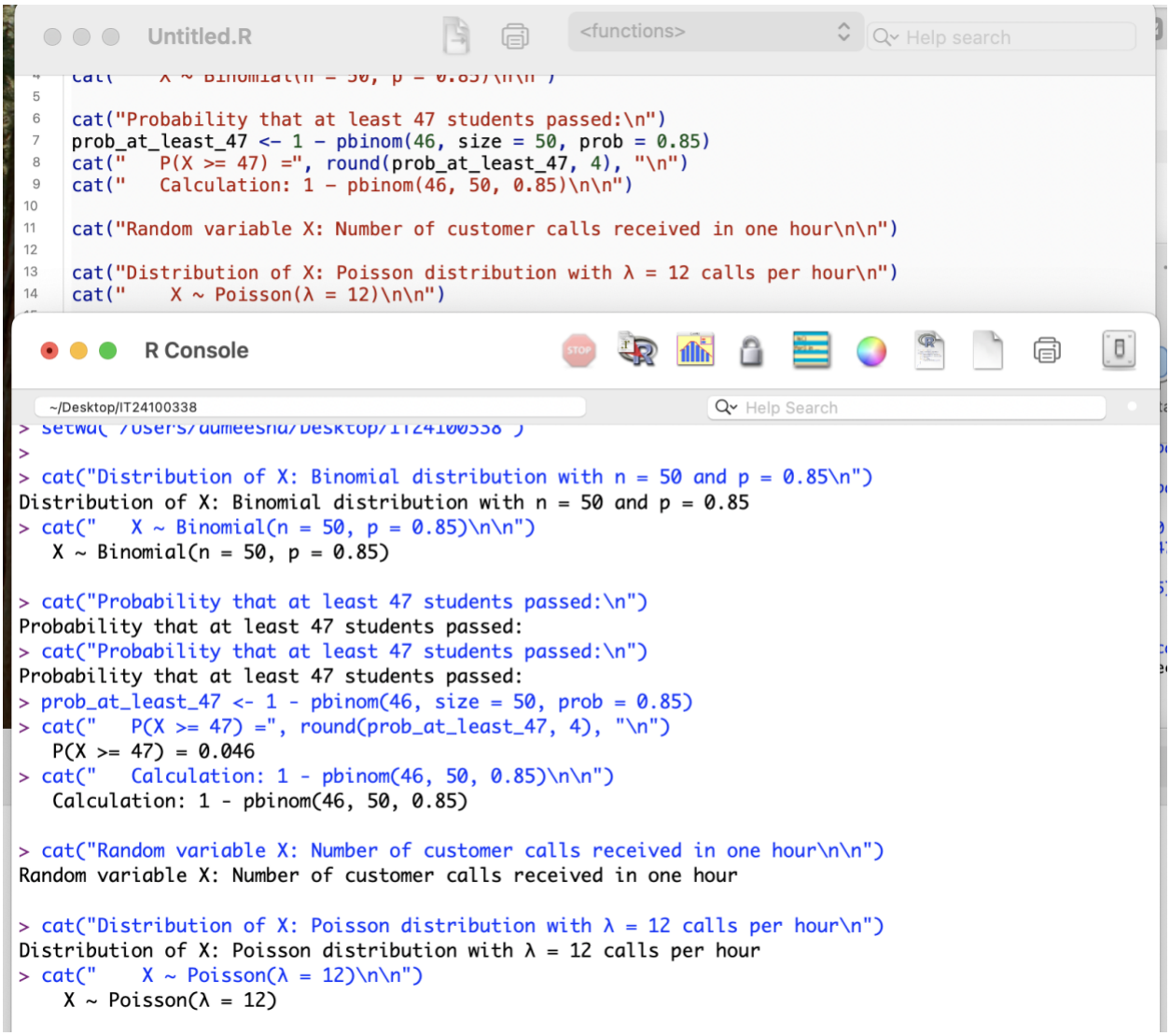


2

I.


Untitled.R
<functions>
Help search
cat("Probability that at least 47 students passed:\n")
prob_at_least_47 <- 1 - pbinom(46, size = 50, prob = 0.85)
cat("   P(X >= 47) =", round(prob_at_least_47, 4), "\n")
cat("   Calculation: 1 - pbinom(46, 50, 0.85)\n\n")
cat("Random variable X: Number of customer calls received in one hour\n\n")
R Console
~/Desktop/IT24100338
Help Search
> cat("Distribution of X: Binomial distribution with n = 50 and p = 0.85\n")
Distribution of X: Binomial distribution with n = 50 and p = 0.85
> cat("   X ~ Binomial(n = 50, p = 0.85)\n\n")
   X ~ Binomial(n = 50, p = 0.85)
> cat("Probability that at least 47 students passed:\n")
Probability that at least 47 students passed:
> cat("Probability that at least 47 students passed:\n")
Probability that at least 47 students passed:
> prob_at_least_47 <- 1 - pbinom(46, size = 50, prob = 0.85)
> cat("   P(X >= 47) =", round(prob_at_least_47, 4), "\n")
   P(X >= 47) = 0.046
> cat("   Calculation: 1 - pbinom(46, 50, 0.85)\n\n")
   Calculation: 1 - pbinom(46, 50, 0.85)
> cat("Random variable X: Number of customer calls received in one hour\n\n")
Random variable X: Number of customer calls received in one hour

II.


Untitled.R
<functions>
Help search
cat("Probability that at least 47 students passed:\n")
prob_at_least_47 <- 1 - pbinom(46, size = 50, prob = 0.85)
cat("   P(X >= 47) =", round(prob_at_least_47, 4), "\n")
cat("   Calculation: 1 - pbinom(46, 50, 0.85)\n\n")
cat("Random variable X: Number of customer calls received in one hour\n\n")
cat("Distribution of X: Poisson distribution with λ = 12 calls per hour\n")
cat("   X ~ Poisson(λ = 12)\n\n")
R Console
~/Desktop/IT24100338
Help Search
> cat("Distribution of X: Binomial distribution with n = 50 and p = 0.85\n")
Distribution of X: Binomial distribution with n = 50 and p = 0.85
> cat("   X ~ Binomial(n = 50, p = 0.85)\n\n")
   X ~ Binomial(n = 50, p = 0.85)
> cat("Probability that at least 47 students passed:\n")
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> cat("Probability that at least 47 students passed:\n")
Probability that at least 47 students passed:
> prob_at_least_47 <- 1 - pbinom(46, size = 50, prob = 0.85)
> cat("   P(X >= 47) =", round(prob_at_least_47, 4), "\n")
   P(X >= 47) = 0.046
> cat("   Calculation: 1 - pbinom(46, 50, 0.85)\n\n")
   Calculation: 1 - pbinom(46, 50, 0.85)
> cat("Random variable X: Number of customer calls received in one hour\n\n")
Random variable X: Number of customer calls received in one hour
> cat("Distribution of X: Poisson distribution with λ = 12 calls per hour\n")
Distribution of X: Poisson distribution with λ = 12 calls per hour
> cat("   X ~ Poisson(λ = 12)\n\n")
    X ~ Poisson(λ = 12)

III.

Untitled.R

```r
cat("   Calculation: 1 - pbinom(46, 50, 0.85)\n\n")

cat("Random variable X: Number of customer calls received in one hour\n\n")

cat("Distribution of X: Poisson distribution with λ = 12 calls per hour\n")
cat("    X ~ Poisson(λ = 12)\n\n")

cat("Probability that exactly 15 calls are received:\n")
prob_exactly_15 <- dpois(15, lambda = 12)
cat("    P(X = 15) =", round(prob_exactly_15, 4), "\n")
cat("    Calculation: dpois(15, 12)\n\n")
```

R Console

~/Desktop/IT24100338

```
> setwd("/Users/dumeeshd/Desktop/IT24100338")
>
> cat("Distribution of X: Binomial distribution with n = 50 and p = 0.85\n")
Distribution of X: Binomial distribution with n = 50 and p = 0.85
> cat("   X ~ Binomial(n = 50, p = 0.85)\n\n")
   X ~ Binomial(n = 50, p = 0.85)

> cat("Probability that at least 47 students passed:\n")
Probability that at least 47 students passed:
> cat("Probability that at least 47 students passed:\n")
Probability that at least 47 students passed:
> prob_at_least_47 <- 1 - pbinom(46, size = 50, prob = 0.85)
> cat("   P(X >= 47) =", round(prob_at_least_47, 4), "\n")
   P(X >= 47) = 0.046
> cat("   Calculation: 1 - pbinom(46, 50, 0.85)\n\n")
   Calculation: 1 - pbinom(46, 50, 0.85)

> cat("Random variable X: Number of customer calls received in one hour\n\n")
Random variable X: Number of customer calls received in one hour

> cat("Distribution of X: Poisson distribution with λ = 12 calls per hour\n")
Distribution of X: Poisson distribution with λ = 12 calls per hour
> cat("    X ~ Poisson(λ = 12)\n\n")
    X ~ Poisson(λ = 12)

> cat("Probability that exactly 15 calls are received:\n")
Probability that exactly 15 calls are received:
> prob_exactly_15 <- dpois(15, lambda = 12)
> cat("    P(X = 15) =", round(prob_exactly_15, 4), "\n")
    P(X = 15) = 0.0724
> cat("    Calculation: dpois(15, 12)\n\n")
    Calculation: dpois(15, 12)
```