

Experiment no 3: Analysis of Binomial Distribution

Abstract

In this experiment we summarize the number of trials, or observations, when each trial has the same probability of attaining one particular value. It calculates the probability of observing a specified number of successful outcomes in a specified number of trials by using Numerical Analysis and Graphical Analysis of R programming.

Introduction:

To gain an understanding of how to use probability density distribution, cumulative probability. R has four in-built functions to generate binomial distribution. But for the experiment we are using two functions as described below.

dbinom(x, size, prob):

This function gives the probability density distribution at each point.

Following is the description of the parameters used –

- **x** is a vector of numbers.
- **size** is the number of trials.
- **prob** is the probability of success of each trial.

pbinom(x, size, prob)

This function gives the cumulative probability of an event. It is a single value representing the probability.

Following is the description of the parameters used

- **x** is a vector of numbers.
- **size** is the number of trials.
- **prob** is the probability of success of each trial

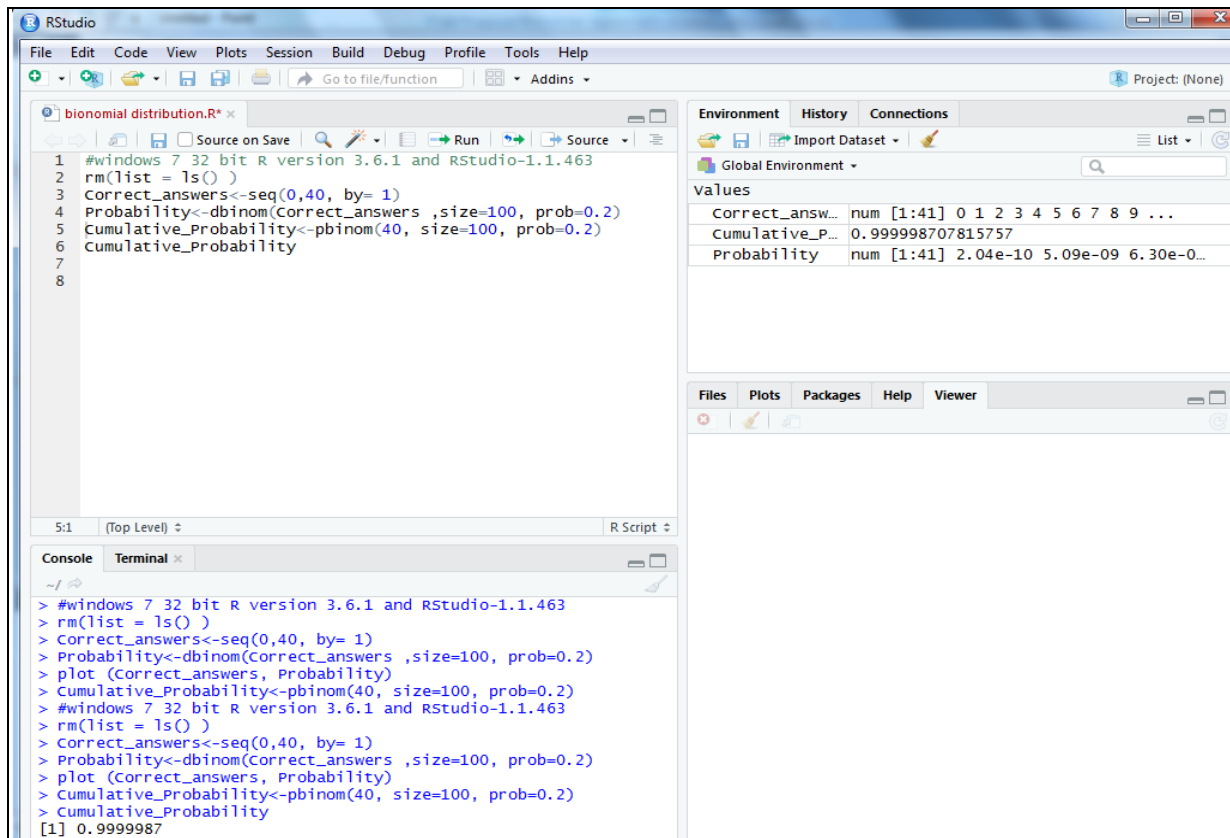
Experiment

Suppose there are one hundred multiple choice questions in an English class quiz. Each question has five possible answers, and only one of them is correct. Find the probability of having forty or less correct answers if a student attempts to answer every question at random.

Solution Steps:

1) Numerical Analysis using R:

To find the probability of having forty or less correct answers by random attempts, we apply the function dbinom .

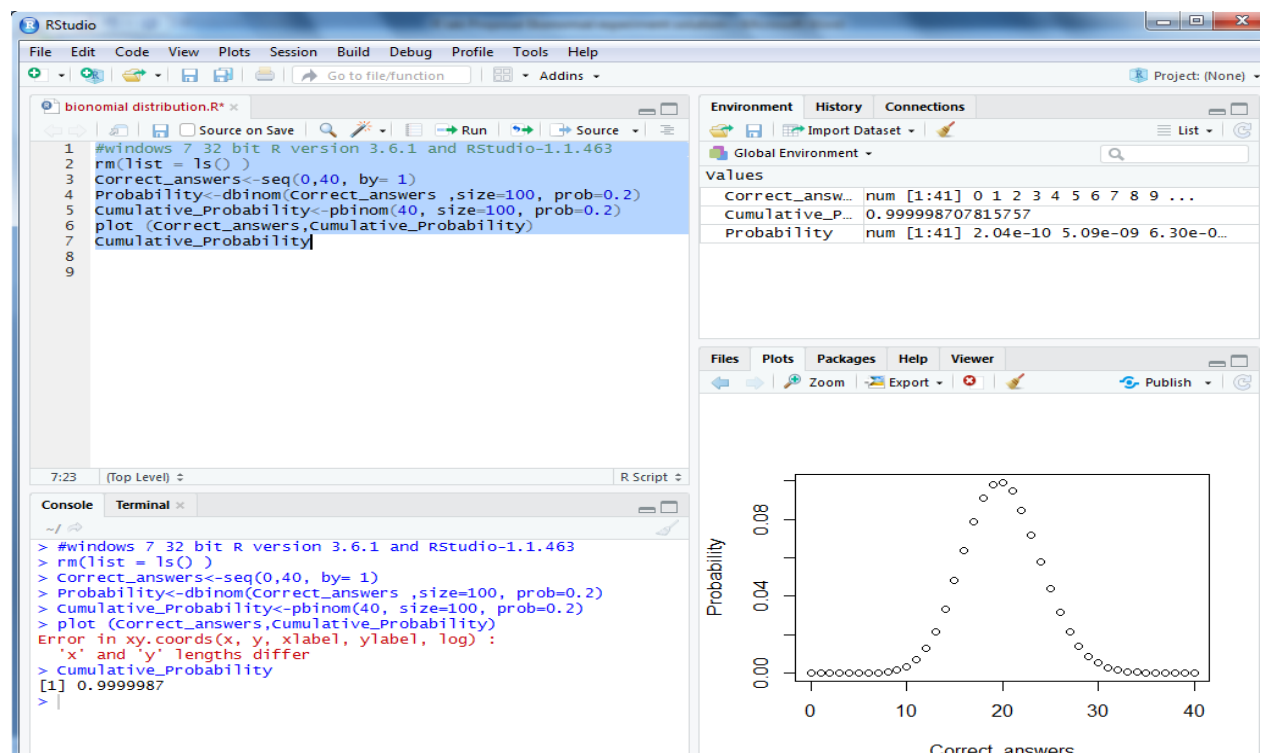


Conclusion:

The probability of forty or less questions answered correctly by random methodology by a student in a one hundred multiple choice question is **99.9%**.

2) Graphical Analysis using R

By using the plot() function we can draw a binomial probability distribution graph between tow variables correct_answers and probability .



Conclusion:

This graphical representation indicates that the probability of forty or less questions answered correctly by random in a one hundred question multiple choice quiz is **99.9%**. It is consistent with our numerical analysis.