Quiz 3

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#Generate 1,000 random numbers from NB(3; 0.2).   
x <- rnbinom(1000, 3, 0.2)  
  
#Calculate sample mean based on the previous random numbers.  
sampleMean <- mean(x)  
sampleMean

## [1] 11.775

#Calculate sample deviation based on the previous random numbers  
sampleDeviation <- sqrt(var(x))  
sampleDeviation

## [1] 7.464858

#Calculating theoretical mean  
theoreticalMean <- 3 \* (1-0.2) / 0.2  
theoreticalMean

## [1] 12

#Calculating theoretical standard deviation  
theoreticalDeviation <- sqrt((3 \* (1-0.2)) / (0.2)^2)  
theoreticalDeviation

## [1] 7.745967

#Create a table to record your answers.   
meanValues <- c(sampleMean, theoreticalMean)  
deviationValues <- c(sampleDeviation, theoreticalDeviation)  
  
table <- rbind(meanValues, deviationValues)  
  
rownames(table) <- c("Mean", "Deviation")  
colnames(table) <- c("Sample", "Theoretical")  
  
table

## Sample Theoretical  
## Mean 11.775000 12.000000  
## Deviation 7.464858 7.745967