

## Assignment 2 Example

LAST NAME: STRUTHERS

FIRST NAME: CYNTHA

USERID: castruth

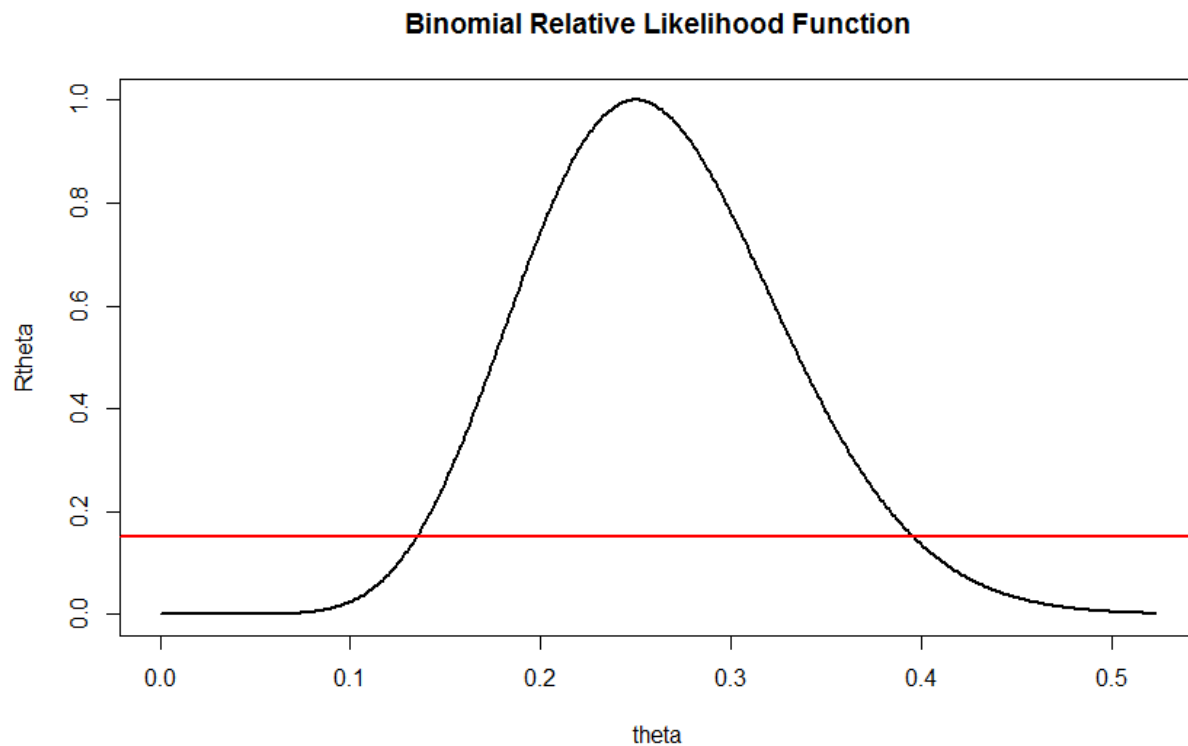
UWaterloo ID: 20456458

**Problem 1:** Fill in the information below based on your Binomial observation which was generated using your ID number as the seed for the random number generator.

theta = 0.2666948

y = 10.0000000

The maximum likelihood of theta is  $\hat{\theta} = 0.25$



Based on the graph of the relative likelihood function and the line  $y = 0.15$  the 15% likelihood interval for  $\theta$  is:  $[0.13, 0.40]$

Using the R function `uniroot` the 15% likelihood interval is:

$[0.1346055, 0.3960402]$ .

$\theta = 0.2$  is a (very) plausible/implausible value of  $\theta$  since ....

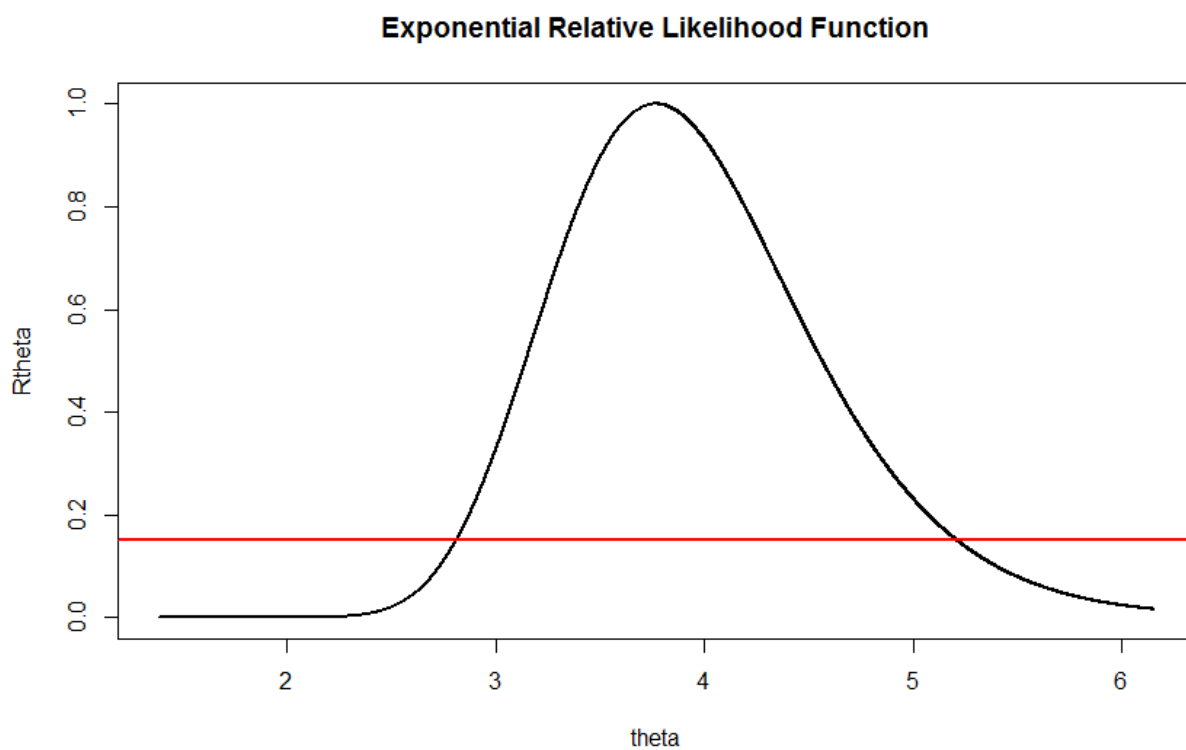
$\theta = 0.8$  is a (very) plausible/implausible value of  $\theta$  since ....

**Problem 2:** The first three numbers in your Exponential data set are:

0.02241854	0.19706745	0.26119882
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**theta = 3.990256**

**The maximum likelihood of theta is  $\hat{\theta}$  = 3.767605**



**Based on the graph of the relative likelihood function and the line  $y = 0.15$  the 15% likelihood interval for theta is: [2.8,5.2].**

**Using the R function uniroot the 15% likelihood interval is:**

**[2.810856, 5.212614].**

**Theta = 2 is a (very) plausible/implausible value of theta since ...**

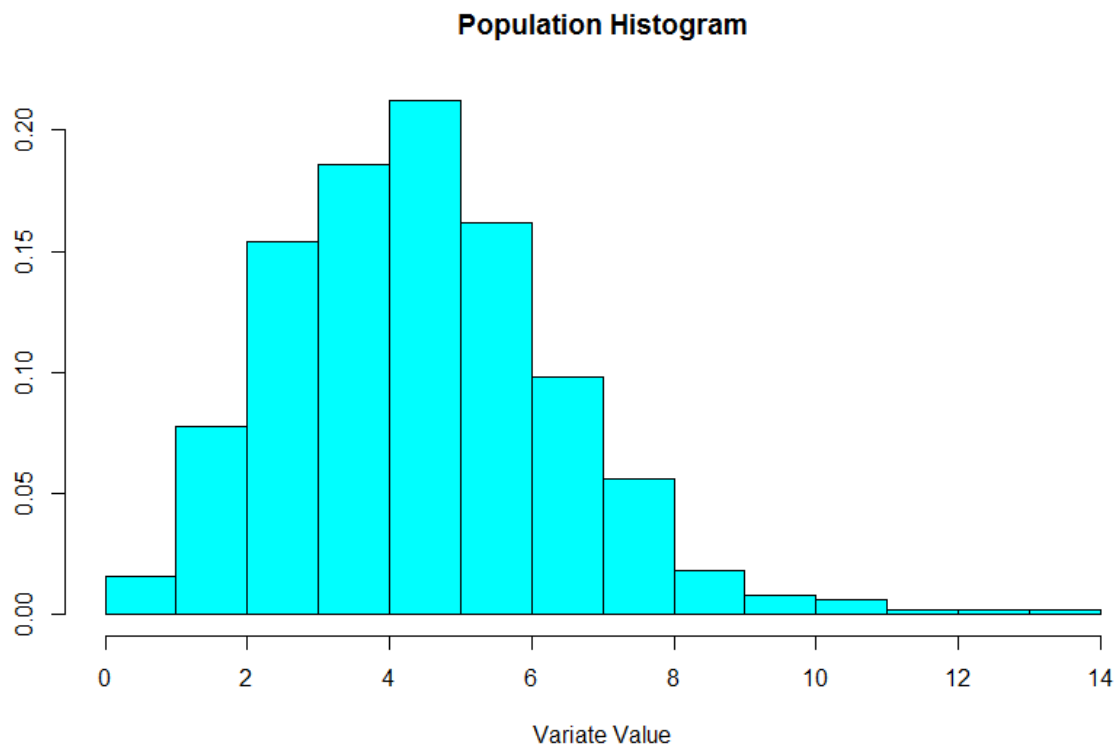
**Theta = 8 is a (very) plausible/implausible value of theta since ...**

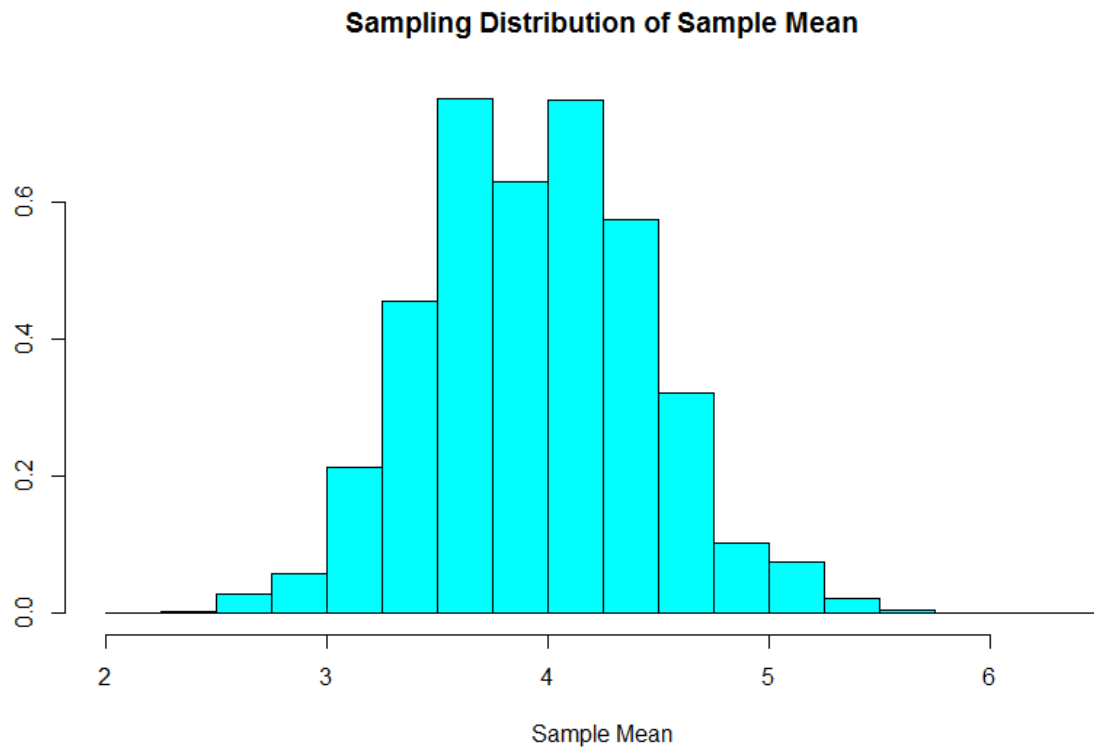
**If Y is a new observation from this Exponential distribution then the maximum likelihood estimate of  $P(Y = 0)$  is .....**

**Problem 3:**

**population mean = 3.93**

**population standard deviation = 1.976133**





**The factor(s) that affect the location of the sampling distribution of the sample mean are ....**

**The factor(s) that affect the spread of the sampling distribution of the sample mean are ....**

**The factor(s) that affect the shape of the sampling distribution of the sample mean are ....**