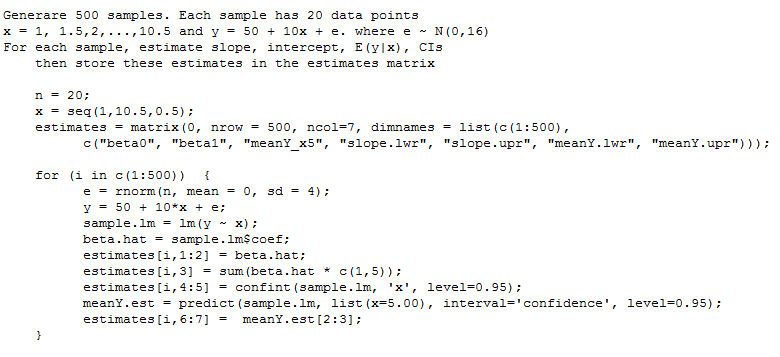
STAT 5531 - linear models

chapter 2 – additional excercise

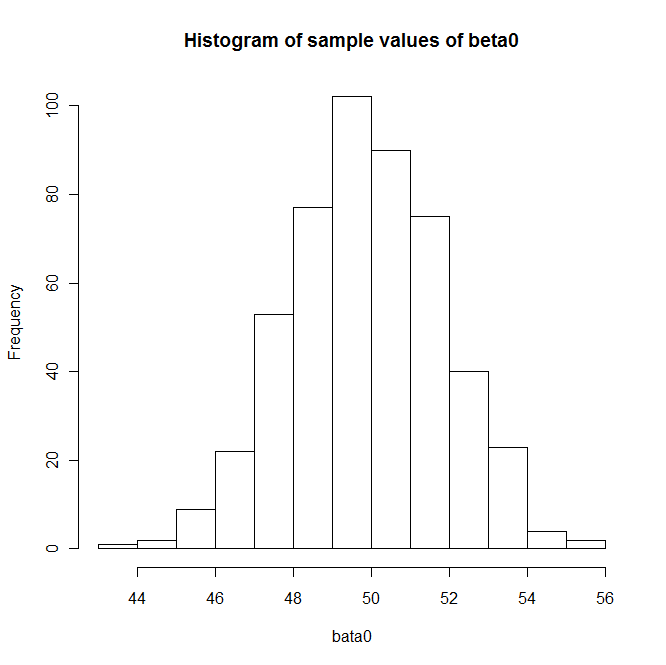
**Thanh Doan – Student ID 0159701**

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| exercise 2.19 |  |

**R code to generate 500 samples and compute sample estimates for question a, b, c, d**

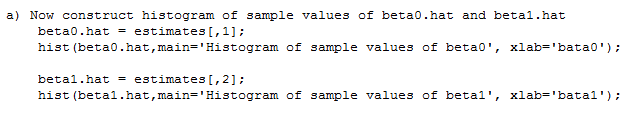
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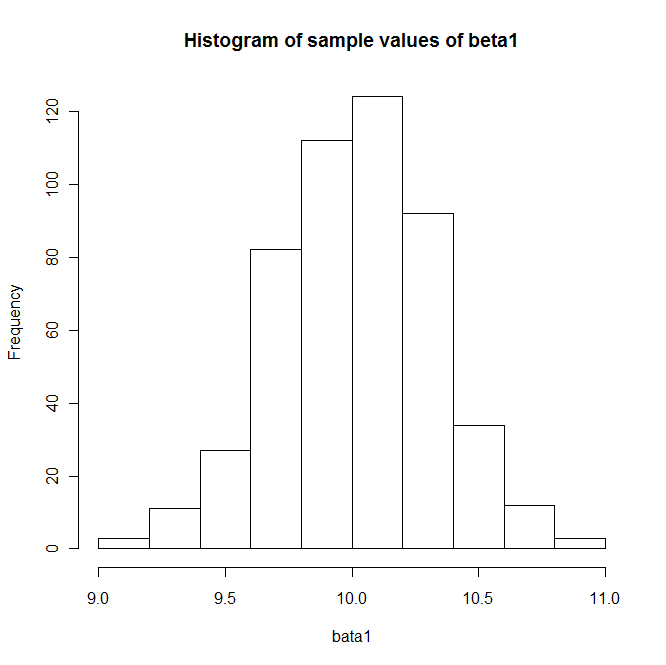
**a – Histograms of sample values of beta0 and beta1**

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| --- | --- |
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**R code to draw histograms using estimate values generated by the R code in previous page**

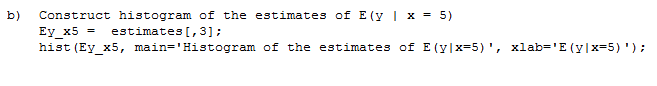
****

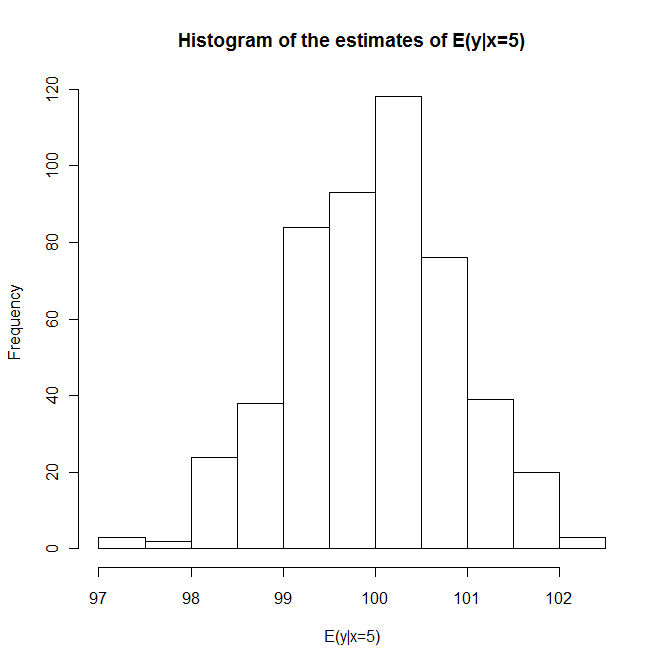


**Discuss the shape of the histograms:**

* The histogram for is centered around 50.
* The one for is centered around 10.
* These histograms are ***consistent*** with the model

**b – Histogram of the 500 estimates of E(y | x = 5) from 500 samples**

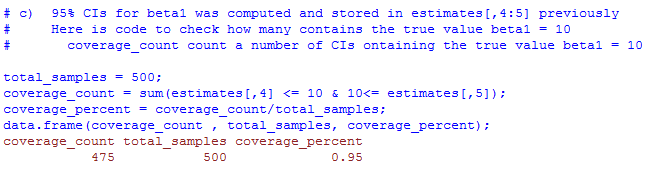
****



**Discuss the shape of the histogram:**

* The histogram of the estimate values of is centered around 100.
* This histogram is ***consistent*** with the model

**c – Compute 95% CI on the slope. How many intervals contain the true value of**

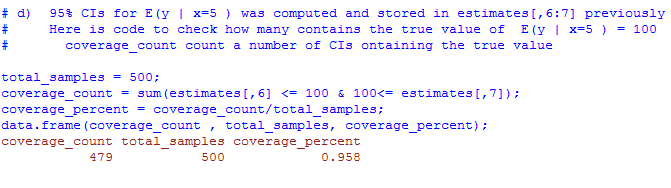


**Answer:**

* 475 confidence intervals contain the true value of
* 475 intervals out of 500 samples are 95%. It sounds like the number is too good to be true. But it is true number computed from the R code a above

**d – Compute 95% CI on E(y | x=5).**

How many intervals contain the true value of E(y | x=5 ) = 100



**Answer:**

* 479 intervals (95.8%) contain the true value of E(y | x=5 ) = 100
* This is ***consistent*** with the model