BIOS668 HW9

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4/18/23

Honor Code: On my honor, I have neither given nor received unauthorized aid on this assignment.” *Sara O’Brien*

**Q1.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model** | **Prior**  P() | **Likelihood** | **Prior x Likelihood** | **Posterior** | **Model x Posterior** |
| 0 | 0.001 | 0 | 0 | 0 | 0 |
| 0.1 | 0.001 | 7.29e-19 | 7.29e-22 | 8.93e-16 | 8.93e-17 |
| 0.2 | 0.001 | 1.34e-13 | 1.34e-16 | 1.64e-10 | 3.28e-11 |
| 0.3 | 0.001 | 1.33e-10 | 1.33e-13 | 1.63e-7 | 4.89e-8 |
| 0.4 | 0.001 | 1.48e-8 | 1.48e-11 | 1.81e-5 | 7.24e-6 |
| 0.5 | 0.99 | 4.77e-7 | 4.72e-7 | 0.578 | 0.289 |
| 0.6 | 0.001 | 6.50e-6 | 6.50e-9 | 0.008 | 0.005 |
| 0.7 | 0.001 | 4.40e-5 | 4.40e-8 | 0.054 | 0.038 |
| 0.8 | 0.001 | 1.44e-4 | 1.44e-7 | 0.176 | 0.141 |
| 0.9 | 0.001 | 1.50e-4 | 1.50e-7 | 0.184 | 0.166 |
| 1.0 | 0.001 | 0 | 0 | 0 | 0 |
| Sum | 1.0 |  | 8.17e-7 | 1 | 0.639 |

Proportion of B is 18/21 = .857, proportion of A is 3/21 = 0.143

P(Y|) = Likelihood:

P(|Y) = Posterior: P( or P(Y)

P(Y) = Sum(P(Y, *)* = Sum(P(Y| *)P(*

**Q2.**

Text, letter

Description automatically generated

**Q3.**

**R Code:**

**Graphical user interface, text, application

Description automatically generated**

**Graphical user interface, text, application, email

Description automatically generated**

**Text, letter

Description automatically generated**

**Graphical user interface, text, application, email

Description automatically generated**

**Summary statistics of estimates of regression coefficients (across replications)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | Intercept | X\_1 | X\_2 | Z |
| Mean | ME | 2.004 | 1.002 | 1.000 | -1.004 |
| No ME | 1.585 | 0.785 | 0.651 | -0.170 |
| Standard deviation | ME | 0.057 | 0.047 | 0.050 | 0.101 |
| No ME | 0.065 | 0.047 | 0.048 | 0.108 |

**Histogram plots of the distribution of estimated regression coefficients**