

# Bios 6301: Assignment 4

Charles Rhea

Good. 17/20

*Due Tuesday, 03 October, 1:00 PM*

$5^{n=\text{day}}$  points taken off for each day late.

20 points total.

This assignment includes turning in the first three assignments. All three should include knitr files (named `homework1.rmd`, `homework2.rmd`, `homework3.rmd`, `homework4.rmd`) along with valid PDF output files. Inside each file, clearly indicate which parts of your responses go with which problems (you may use the original homework document as a template). Add your name as `author` to the file's metadata section. Raw R code/output or word processor files are not acceptable.

Failure to properly name files or include author name may result in 5 points taken off.

## Question 1

10 points

1. Use GitHub to turn in the first four homework assignments. Make sure the teacher (couthcommander) and TA (mhblackman) are collaborators. (5 points) *Completed*
2. Commit each assignment individually. This means your repository should have at least four commits. (5 points) *Completed*

## Question 2

1) Good but need to preserve line structure. Also where did the  $A_i$ 's come from?  
2 and 3) Good but your  $x$ 's are showing up as a different symbol

10 points

Use  $\text{\LaTeX}$  to create the following expressions.

1.

$$P(B) = \sum_j P(B|A_j)P(A_j), \Rightarrow P(A_i|B) = \frac{P(B|A_i)P(A_i)}{\sum_j P(B|A_j)P(A_j)}$$

2.

$$\hat{f}(\zeta) = \int_{-\infty}^{\infty} f(\xi) e^{-2\pi i \xi \zeta} d\xi$$

3.

$$\mathbf{J} = \frac{d\mathbf{f}}{d\mathbf{x}} = \left[ \frac{\partial \mathbf{f}}{\partial \xi_1} \cdots \frac{\partial \mathbf{f}}{\partial \xi_n} \right] = \begin{bmatrix} \frac{\partial f_1}{\partial \xi_1} & \cdots & \frac{\partial f_1}{\partial \xi_n} \\ \vdots & \ddots & \vdots \\ \frac{\partial f_m}{\partial \xi_1} & \cdots & \frac{\partial f_m}{\partial \xi_n} \end{bmatrix}$$