# Bios 6301: Assignment 4

## Jonathan Lifferth

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

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

Good. 17/20

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)

2. Commit each assignment individually. This means your repository should have at least four commits. (5 points)

**Question 2**

**10 points**

Use LaTeX to create the following expressions.

1. Hint: `\Rightarrow` (4 points)

!latex

$

i am seeing there is some type of render problem with the extra ! and $

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

$

you want to preserve the line structure from the prompt

`![equation1](eq1.png)`

2. Hint: `\zeta` (3 points)

!latex

$

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

1

![equation2](eq2.png)

3. Hint: \partial (3 points)

$

$$ J = \frac{df}{dx} = [\frac{\partial \text{f}}{\partial x_1} ... \frac{\partial \text{f}}{\partial x_n}] = \begin{bmatrix} \frac{\partial f_1}{\partial x_1} & \cdots & \frac{\partial f_1}{\partial x_n} \\ \vdots & \ddots & \vdots \\ \frac{\partial f_m}{\partial x_1} & \cdots & \frac{\partial f_m}{\partial x_n} \end{bmatrix} $$

![equation3](eq3.png)

use \left and \right to increase bracket size for middle vector

need to bold where indicated