My first Document

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1 Solution to Section 1: Instructions

The LaTeX platform is installed on the machine. Go to Figure 1 for picture proof.

2 Solution to Section 2: Course Setup

2.1 Solution to Section 2.1

Python has been installed. Take a look at Figure 2 for picture proof, and Confirmation.py for the code.

2.2 Soltution to Section 2.2

GitHub repository is up. pablorp80 is added as a collaborator.the site can be found here.There's another screenshot from the collaborator page, Figure 3

2.3 Solution to Section 2.3

Kaggle is up. My username is Gingerbreed. There is proof in Figure 4.

3 Solution to Section 3

No Deliverables.

4 Solution to Section 4

4.1 Solution to Section 4.1

The x value that maximizes the function $-3x^2 + 24x - 30$ can be found by setting the derivative to 0. The derivative of the function is $-6x + 24$. The 0 for the derivative is 4, meaning the maximum for the function $-3x^2 + 24x - 30$ is 4.

4.2 Solution to Section 4.2

The partial derivative of a function is taking a function and deriving the specific variables. The partial derivative of the function $3x^3 - 2xy^2 + 4y - 8$ with respect to X is $9x^2 - 2y^2$. The partial derivative with respect to y (x1) is $-4xy + 4$. or $-4 * (xy - 1)$.

4.3 Solution to Section 4.3a

The matrices $\begin{matrix} 1 & 4 & -3 \\ 2 & -1 & 3 \end{matrix}$ and $\begin{matrix} -2 & 0 & 5 \\ 0 & -1 & 4 \end{matrix}$ cannot be multiplied! The shapes of the matrices need to be reversed. An example is 3 by 2 and 2 by 3, but not 3 by 2 and 3 by 2.

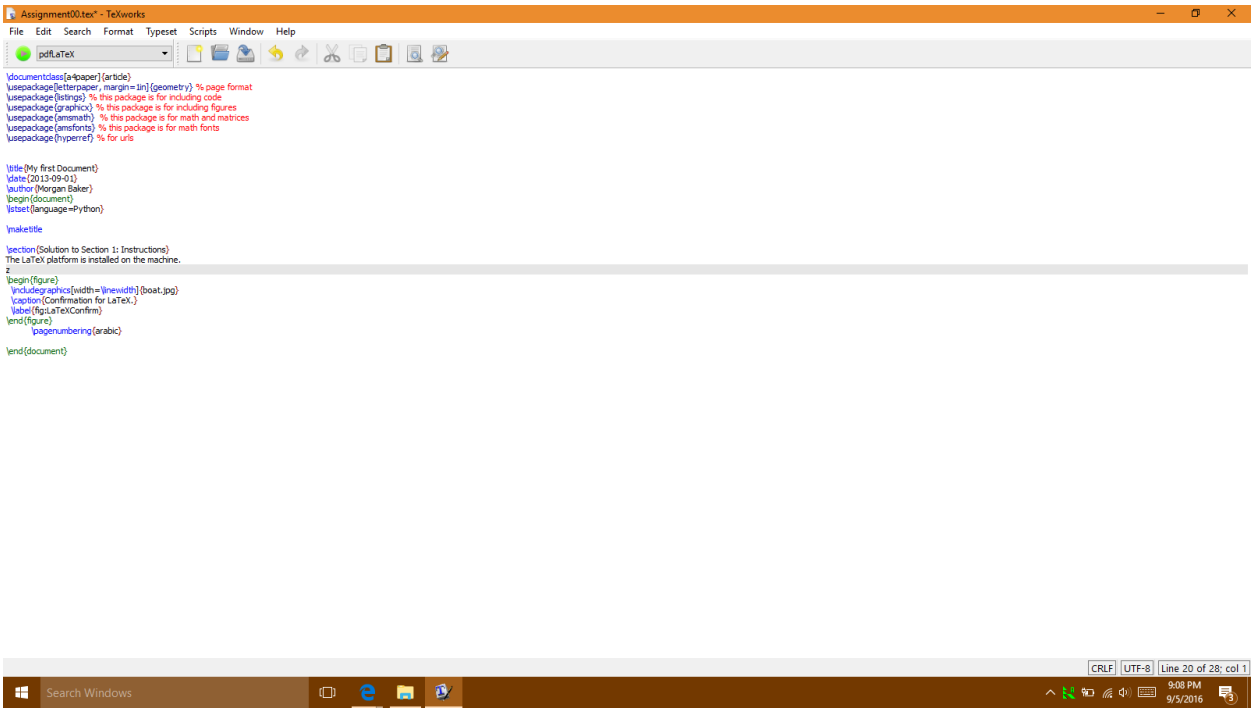

Figure 1: Confirmation for LaTeX.

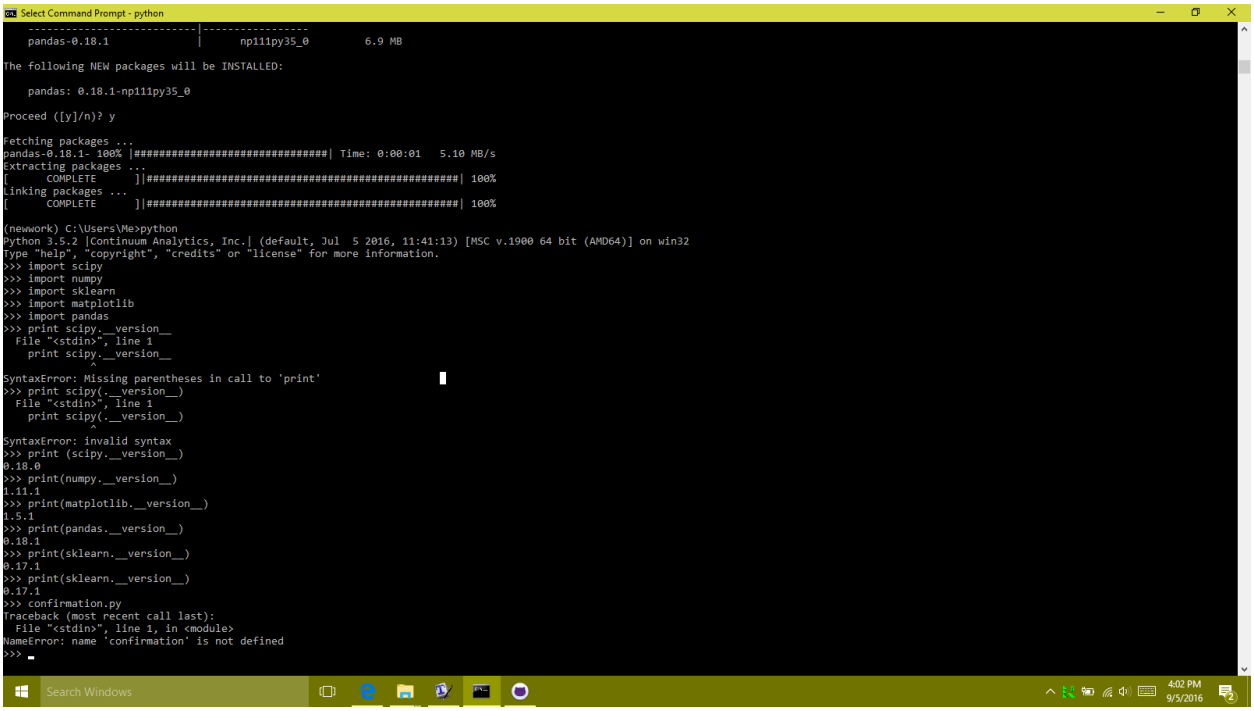

Figure 2: Confirmation for Python.

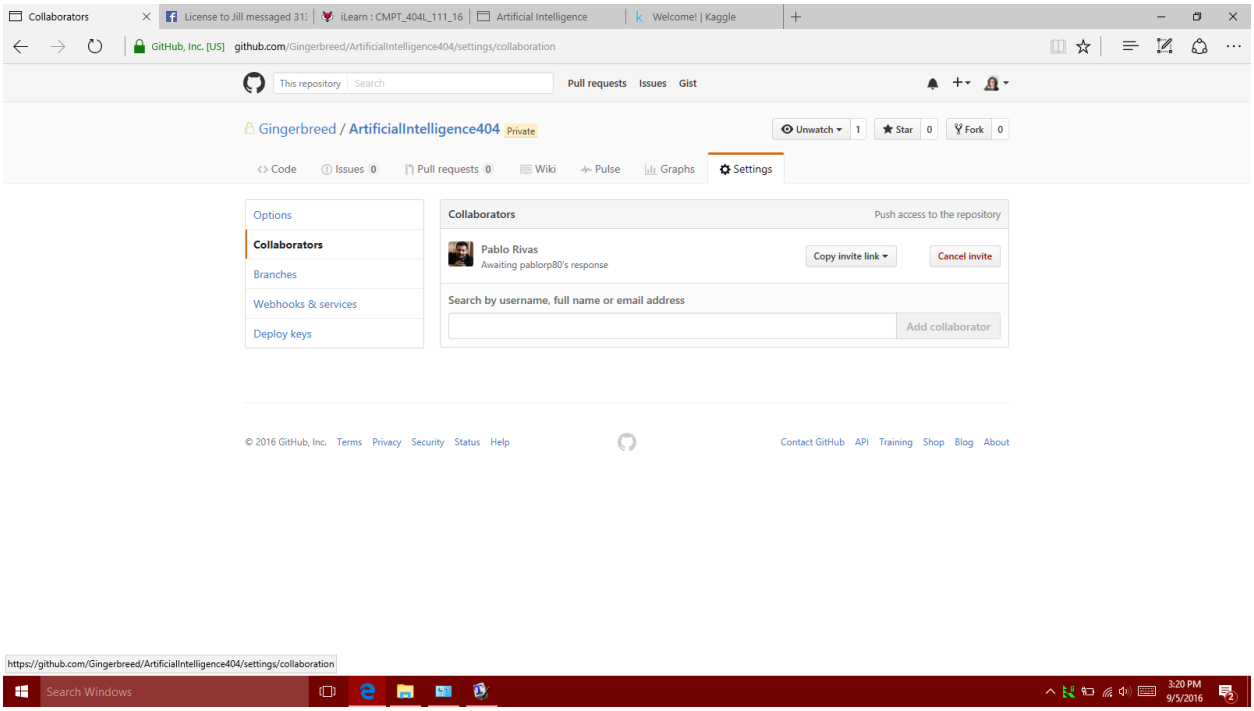

Figure 3: Confirmation for Collaborators.

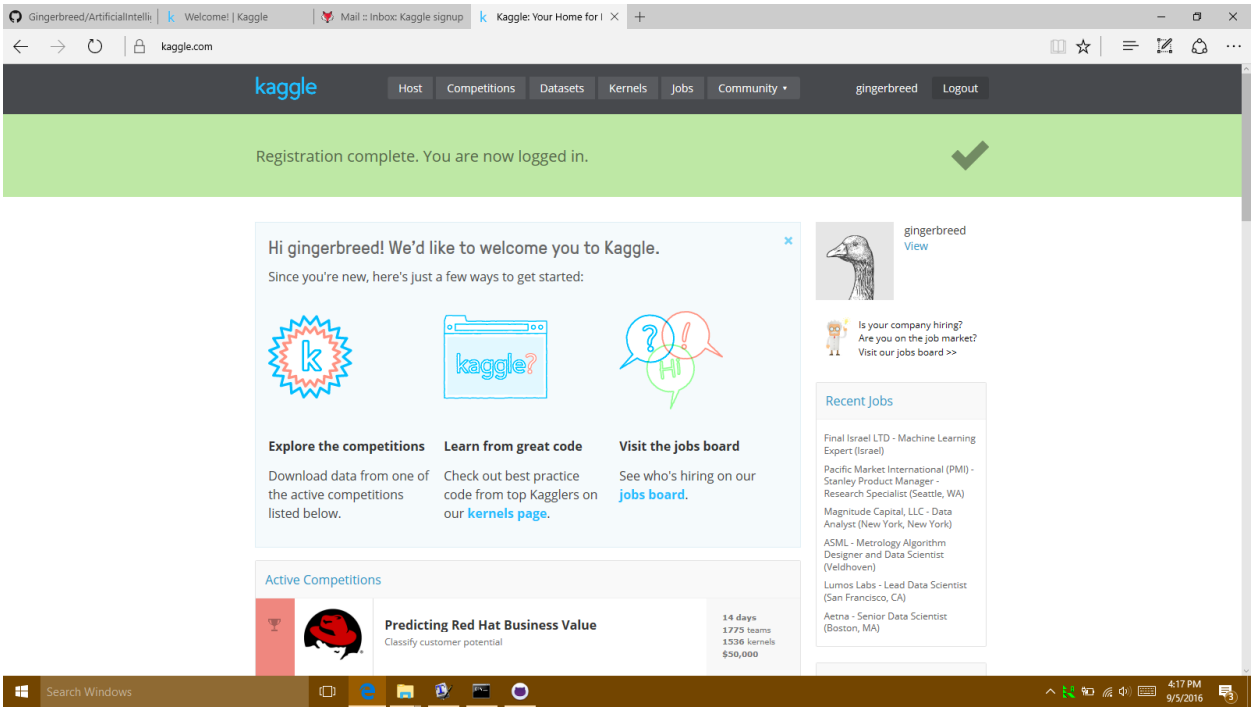

Figure 4: Confirmation for Kaggle.

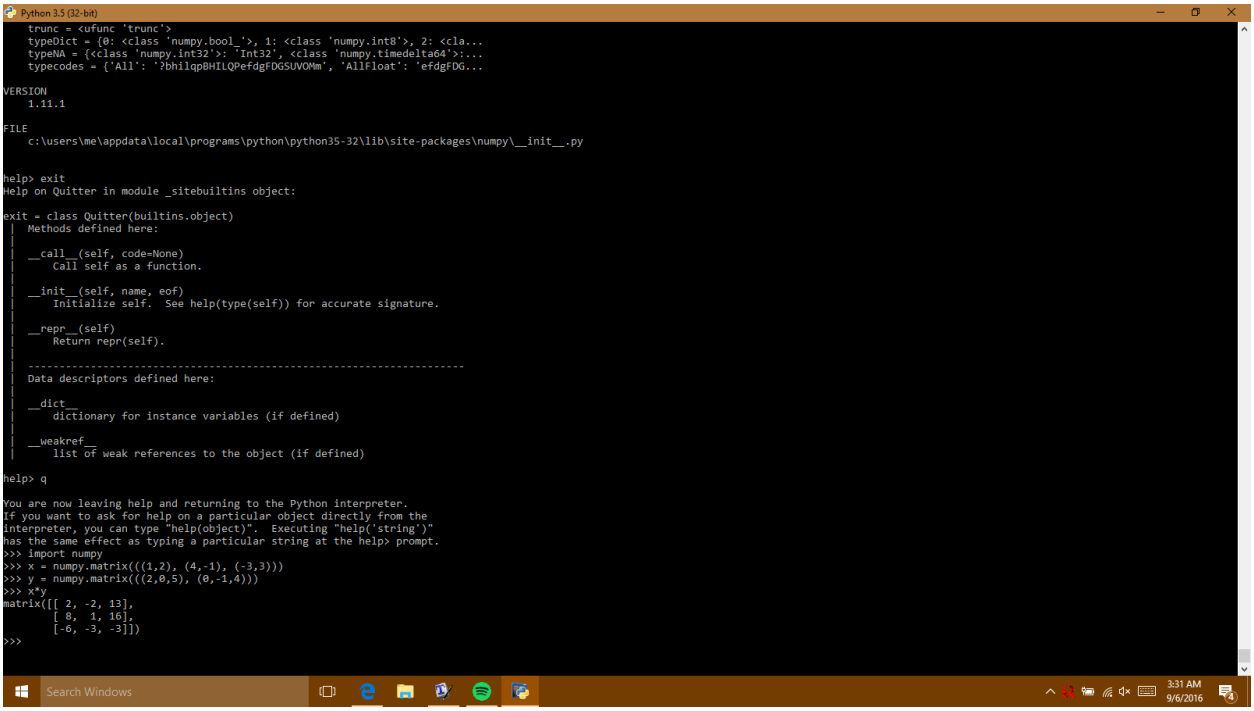

Figure 5: Confirmation for problem 4.3b.

4.3.1 Solution to Section 4.3b

The multiplication of the two matrices in the first section requires the transverse of matrix A (the first one). Finding the transverse is done by flipping the rows and making them into columns. The transverse of matrix A $\begin{matrix}1 & 4 & -3\\ 2 & -1 & 3\end{matrix}$ is the matrix $\begin{matrix}1 & 2\\ 4 & -1\\ -3 & 3\end{matrix}$ The new matrix can now be multiplied with matrix B (3 by 2 and 2 by 3). This is done by crossing the rows and columns of the two matrices. the end result is $\begin{matrix}-2 & -2 & 13\\ -8 & 1 & 16\\ 6 & -3 & -3\end{matrix}$

You can see how this is true by looking at Figure 5

4.3.2 Solution to Section 4.3c

This is a question for Graduate Students. I am not one of those.

4.4 Solution to Section 4.4

A Gaussian distribution is better known as a bell curve. It has a high point. A multivariate Gaussian is a higher version of a simple Gaussian. A Bernoulli is a distribution that will change depending on the input (usually with two cases). A binomial distribution uses the probability successes over trials. An exponential distribution is using a rate of change to predict success.

4.5 Solution to Section 4.5

This question is for Graduate Students. I am not one of those.

4.6 Solution to Section 4.6

Assuming that N is a probability distribution, the expected value of the distribution would be 2.

4.7 Solution to Section 4.7a

The answer to this question is 1.1. The minimum natural number is 0, so the arg min should be equal to 0. Since y is = to 1.1, x needs to be equal to 1.1 to achieve the minimum natural number.

4.7.1 Solution to Section 4.7b

The location of x* is as close to the y point as possible with one constraint. The x* must stay within the oval Z, because x* is still in the range of Z.

4.8 Solution to Section 4.8a

This is to verify that the closer you get to infinity, the upper limit of the function becomes 1. This can be seen by adding up the intervals. $e^-1 + e^-2$ is closer to 1 than the two by themselves. but what about e^0, which should = 1? that gets cancelled by the other side, negative infinity.

4.8.1 Solution to Section 4.8b

The average (expected value) should be close to 0, if not zero. The mean requires you to add all the values and divide. $e^-1 + e^0 + 0 > e^-2 + e^-1 + e^0 + 0 + 0$ The zeroes in the equation are from the negatives. Considering the right side of this equation is only .3, the average for all of infinity would be 0.

4.8.2 Solution to Section 4.8c

The variance here would be from 0(infinity) to 1(x=0), so the variance would be 1.

4.8.3 Solution to Section 4.8d

This would be a very small number, considering when y = 10 the function spits out $4.0 * 10^-5$. I don't know exactly what the number would be, however.