Assignment 0

RELEASE DATE: 01/20/2026

DUE DATE: 01/29/2026 11:59pm on Gradescope

LaTeX Template: https://www.overleaf.com/read/pzhhcsmdfyst#557346

Name: First-Name Last-Name UIN: 000000000

This assignment consists of two parts: a writing section and a programming section. For the writing section, please use the provided LaTeX template to prepare your solutions and remember to fill in your name and UIN. For the programming section, please follow the instructions carefully.

*Discussions with others on course materials and assignment solutions are encouraged, and the use of AI tools as assistance is permitted. However, you must ensure that **the final solutions are written in your own words**. It is your responsibility to avoid excessive similarity to others' work. Additionally, please clearly **indicate any parts where AI tools were used** as assistance.*

If you have any question, please send an email to csce638-ta-26s@list.tamu.edu

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1 Including Equations with LaTeX [40pts]

Please typeset the following equation in LaTeX.

$$\frac{\partial \mathcal{L}_{\text{total}}}{\partial \mathbf{w}_j} = -\frac{1}{m} \sum_{i=1}^{m} \big(y_i - \sigma(z_i)\big) \cdot \mathbf{x}_{i,j}$$

You can learn some basics about LaTeX here.

Solution:

Please enter your solution here.

2 Including Figures with LaTeX [30pts]

Please randomly choose a photo of cat and display it.

Solution:

Please enter your solution here.

3 Programming [30pts]

CSCE638-S26-HW0-3.ipynb: Colab Notebook

Please open the above Colab Notebook with Google Colab. **Remember to use your *@tamu.edu* email to access the Colab Notebook.** Copy the Colab Notebook to your Google drive and make the changes. The notebook has marked blocks where you need to code:

```
### ========= TODO : START ========= ###
...
### ========= TODO :  END   ========= ###
```

You can learn some basics about Colab here.

Please implement a function called `vec_square`:

- Input: a `numpy.array` list v of arbitrary length

- Output: a `numpy.array` list y with $y_i = v_i^2$

- Examples:

    - Input: $[1.4, 2.7, 3.9] \rightarrow$ Output: $[1.96, 7.29, 15.21]$
    - Input: $[-1.0, 0.0, -0.5, 10.1] \rightarrow$ Output: $[1.0, 0.0, 0.25, 102.01]$

Please copy and paste your code as well as the output as the solution. You can use the Minted package for code highlighting. Here is one example:

```python
def hello_world():
    print("Hello World!")
```

Solution:

Please enter your solution here.

Submission Instructions

You have to upload two files to Gradescope:

- `report.pdf`: The `.pdf` file generated by the LaTeX template. Please remember to **annotate the correct page for each question** on Gradescope. Failure to do so may result in a grade penalty.

- `programming.zip`: A `.zip` file contains the following:

    - `problem3.py`: Please export the Colab Notebook to a `.py` file by clicking "File" $\rightarrow$ "Download" $\rightarrow$ "Download .py"
    - `problem3.ipynb`: Please execute and export the Colab Notebook to a `.ipynb` file by clicking "File" $\rightarrow$ "Download" $\rightarrow$ "Download .ipynb"