Assignment 5: Neural Network Testing

Assignment Description

In this assignment, your goal is to maximize the testing accuracy (minimize the testing error, not training error!) on the California Housing Dataset using various techniques. Follow the instructions below:

We have written a code for you here:
Click here to access.

1. **Tasks:**
    - Vary the neural network architecture.
    - Vary the optimizer (e.g., SGD, Adam, RMSprop, etc.).
    - Adjust the number of epochs.
    - Add dropout layers to prevent overfitting.
    - Implement regularization techniques (e.g., L1, L2 regularization).
    - Experiment with different learning rates for the optimizer.
    - Modify the train-test split ratio.
    - Integrate batch normalization layers into your neural network.
2. **Procedure:**
    - Open the provided Google Colab notebook or use your preferred environment.

- Implement each variation separately and record the testing accuracy/testing loss achieved.
- Provide a brief description of the changes made for each variation (architecture, optimizer, epochs, etc.).
- Document the testing accuracy achieved for each configuration.
- Discuss your observations on how each change affected the testing accuracy and convergence speed.

3. **Deliverables:**

   - A report summarizing your findings, including a comparison of testing accuracies across different configurations.
   - Plots or tables showing the impact of each variation on testing accuracy.
   - Insights into which configurations worked best and why.

Submission Guidelines

Submit your report along with any additional analysis or insights you find relevant.