Final Project Report: AI Model Comparison

Course: Introduction to AI  
Project Title: Stock Price Predictor  
Submitted by:

* Cisco Dacanay
* Zach Greenhill

Date: 12/11/24

# 1. Introduction and Objective (5 Marks)

**Objective:**State the main objective of the project here.

**Problem Statement:**Describe the specific problem or task the models are designed to solve.

**Overview of AI Models Chosen:**

|  |  |  |
| --- | --- | --- |
| Model Number | Model Name | Purpose |
| 1 | [Model 1 Name] | Brief purpose of Model 1 |
| 2 | [Model 2 Name] | Brief purpose of Model 2 |
| 3 | [Model 3 Name] | Brief purpose of Model 3 |
| 4 | [Model 4 Name] | Brief purpose of Model 4 |
| 5 | [Model 5 Name] | Brief purpose of Model 5 |

# 2. Justification of Model selection (2 Marks)

Justification for Model Selection:

|  |  |
| --- | --- |
| Model Name | Reason for Selection |
| Model 1 | Justification |
| Model 2 | Justification |
| Model 3 | Justification |
| Model 4 | Justification |
| Model 5 | Justification |

# 3. Model Descriptions (1 Marks)

Model Overview:

|  |  |  |  |
| --- | --- | --- | --- |
| Model Number | Model Name | Architecture Details | Key Features |
| 1 | [Model 1 Name] | Architecture details | Key features of Model 1 |
| 2 | [Model 2 Name] | Architecture details | Key features of Model 2 |
| 3 | [Model 3 Name] | Architecture details | Key features of Model 3 |
| 4 | [Model 4 Name] | Architecture details | Key features of Model 4 |
| 5 | [Model 5 Name] | Architecture details | Key features of Model 5 |

# 4. Dataset Description (2 Marks)

Dataset Information:

|  |  |
| --- | --- |
| Dataset Attribute | Description |
| Name | [Description] |
| Source | [Description] |
| Size | [Description] |
| Class Distribution | [Description] |
| Preprocessing Steps | [Description] |
|  |  |

Example

|  |  |
| --- | --- |
| Name | CIFAR-10 |
| Source | Available from https://www.cs.toronto.edu/~kriz/cifar.html |
| Size | 60,000 images (50,000 for training, 10,000 for testing) |
| Class Distribution | 10 classes, with 6,000 images per class |
| Preprocessing Steps | Normalization to range [0, 1], data augmentation (random cropping, horizontal flipping) |

**Dataset Justification:**  
Explain why this dataset is suitable for the models.

# 5. Experimental Setup (10 Marks)

Experimental Design: If any other metric is used, add it to the table

|  |
| --- |
| Metric |
| Mean Squared Error |
| Root Mean Squared Error |
| Mean Absolute Error |

Parameter Settings:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Model Name | Learning Rate | Epochs | Hyperparameter 3 | Hyperparameter 4 | Additional Notes |
| XGB | 0.1 | 100 |  |  | Any other notes |
| Model 2 | Value | Value | Value | Value | Any other notes |
| Model 3 | Value | Value | Value | Value | Any other notes |
| Model 4 | Value | Value | Value | Value | Any other notes |
| Model 5 | Value | Value | Value | Value | Any other notes |

Environment Details:

|  |  |
| --- | --- |
| Component | Specification |
| Operating System | [Specification] |
| Software Version | [Specification] |
| Hardware | [Specification] |
| Link to the code base | https://github.com/GreenhillZachary/CS482\_Final\_Project |

# 6. Results and Analysis (50 Marks)

Performance Metrics:

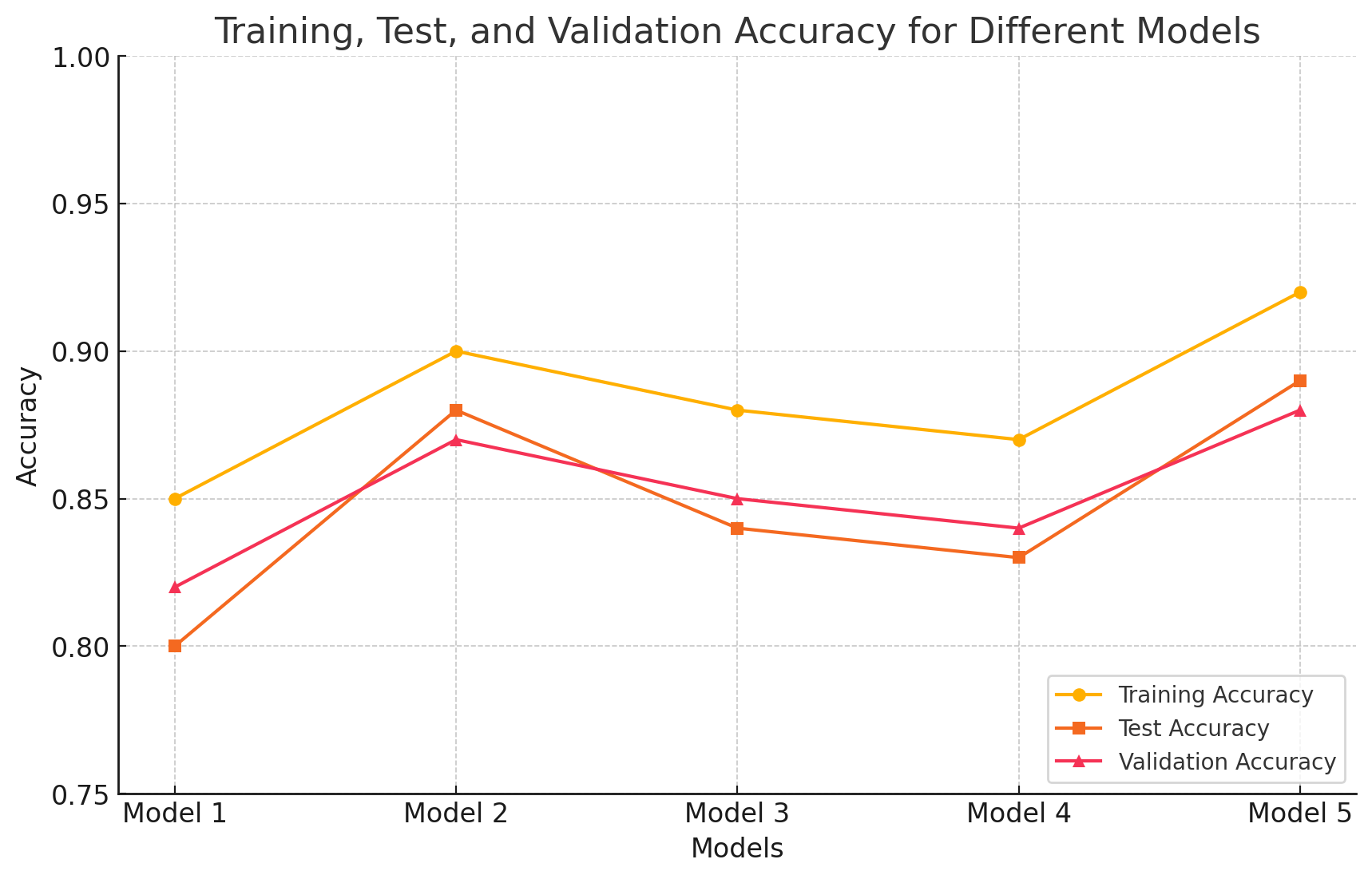
|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Model Name | Mean Squared Error (MSE) | Root MSE | Mean Absolute Error | R2 Score |  |
| XGBoost | 38.2049 | 6.1810 | 3.3770 | 0.9846 |  |
|  |  |  |  |  |  |
| Model 3 | [Value] | [Value] | [Value] | [Value] | [Value] |
| Model 4 | [Value] | [Value] | [Value] | [Value] | [Value] |
| Model 5 | [Value] | [Value] | [Value] | [Value] | [Value] |

Comparative Analysis:  
Summarize and analyze differences in performance.

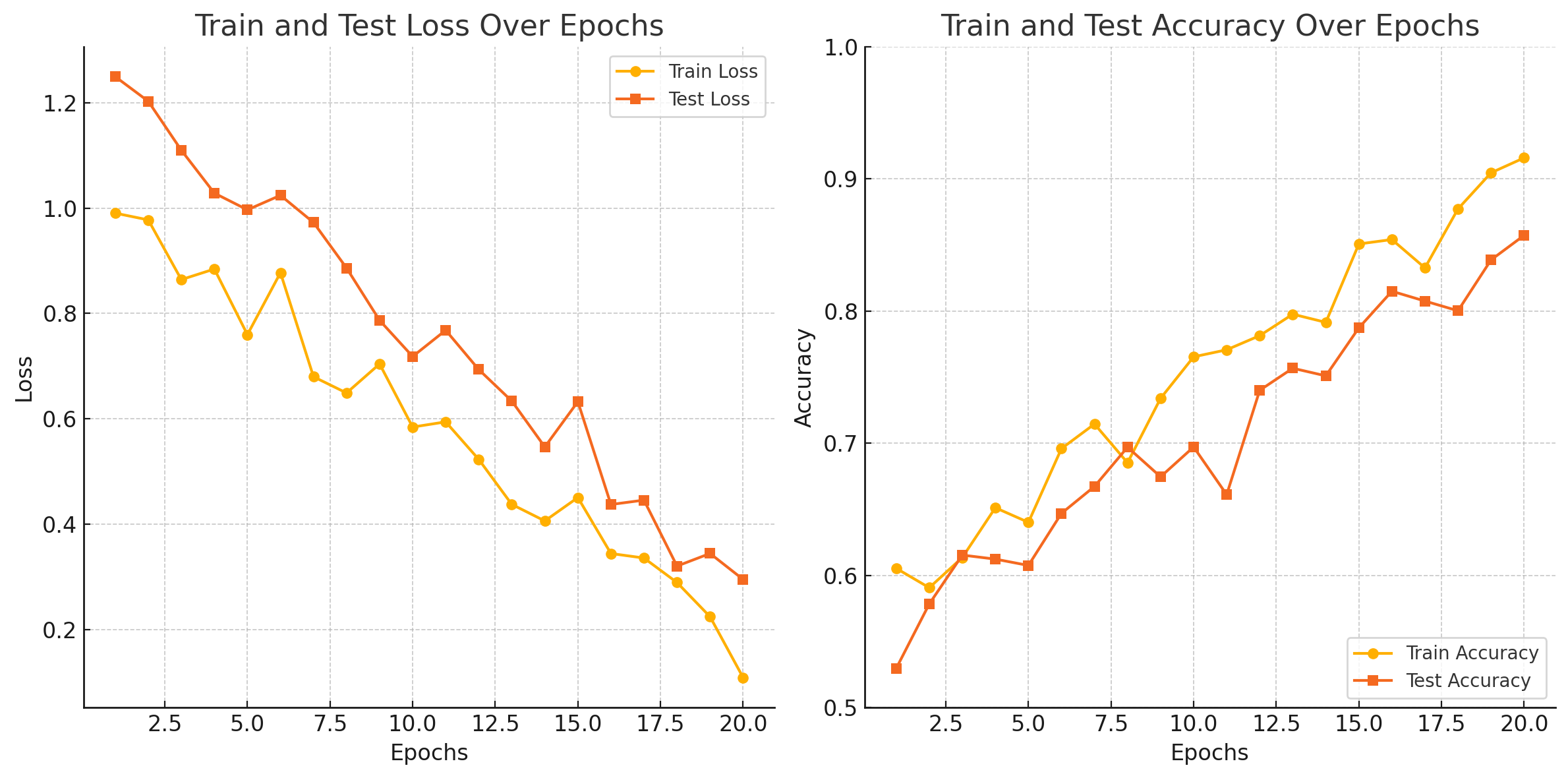
Error Analysis:  
Identify main sources of error and discuss possible reasons.

**Plots**

**- Training and Test accuracies**



**For neural network-based model, plot the following**



# 7. Discussion and Insights (10 Marks)

Interpretation of Results:  
Discuss key insights gained from the model comparison.

Limitations:  
Mention any limitations in the experimental design, data, or model performance.

Future Directions:  
Provide suggestions for further improvements or research.

# 8. Conclusion (5 Marks)

Summarize the project findings and the strengths and weaknesses of each model.