Test Plan and Results

**Overall Test Plan**

This test plan provides a validation for the Stock Predictor machine learning model. The document presents a set of test suites that the model must pass in order to be considered functional and usable to the users. Information about each individual test case regarding certain criterias, scopes and expected results are also specified.

**Test Case Descriptions**

CM1.1 **Create New Model**

CM1.2 This test will ensure the user must be able to create new machine learning model.

CM1.3 Inputs: The inputs for this test will be the command line the user enters with default learning hyperparameters to build the neural network model.

CM1.4 Outputs: Tensorflow creates a new RNN model to train and predict stock prices.

CM1.5 Normal

CM1.6 Blackbox

CM1.7 Functional

CM1.8 Unit Test

SS1.1 **Select stock symbol**

SS1.2 This test will ensure the user can select the stock choice they want the model to train and make prediction.

SS1.3 Inputs: The experimenter might select from a list of available stock prices from the database.

SS1.4 Outputs: The system creates a new RNN model and gets the selected stock dataset as training data points.

SS1.5 Normal

SS1.6 Blackbox

SS1.7 Functional

SS1.8 Unit Test

SP1.1 **Select learning hyperparameters**

SP1.2 This test will check the use of tuning different parameters with the environment and ensure that users are allowed to change default flags and parameters for customized model.

SP1.3 Inputs: The experimenter might select from a list of available stock prices from the database.

SP1.4 Outputs: The system creates a new customized RNN model with changed default parameter.

SP1.5 Normal

SP1.6 Whitebox

SP1.7 Functional

SP1.8 Unit Test

LM1.1 **Load existing trained model**

LM1.2 This test will check that users are able to load a previously saved model to continue training and making predictions.

LM1.3 Inputs: The user selects the saved model to open and load to the system.

LM1.4 Outputs: The model is loaded into the terminal and the status and results are displayed if any.

LM1.5 Normal

LM1.6 Blackbox

LM1.7 Functional

LM1.8 Unit Test

SM1.1 **Save trained model**

SM1.2 This test will check that users are able to save a trained model the local directory.

SM1.3 Inputs: The user selects the option to save the model into the computer.

SM1.4 Outputs: The model is saved into the computer.

SM1.5 Normal

SM1.6 Blackbox

SM1.7 Functional

SM1.8 Unit Test

TM1.1 **Train the machine learning model**

TM1.2 This test will check that the learning and prediction process of the RNN model according to the training options and the learning procedure specified by the learning components.

TM1.3 Inputs: The user run the command line arguments with the --train flag to train the model.

TM1.4 Outputs: The prediction results (including plots, data files, trained model) is saved into the source directory.

TM1.5 Normal

TM1.6 Whitebox

TM1.7 Functional

TM1.8 Unit Test

EM1.1 **Export the machine learning model**

EM1.2 This test will check the export function of Tensorflow and the model to be used by other programs.

EM1.3 Inputs: The user run the command line arguments with the --export flag to save and export the model.

EM1.4 Outputs: The prediction results (including plots, data files, trained model) is saved into the source directory.

EM1.5 Normal

EM1.6 Whitebox

EM1.7 Functional

EM1.8 Unit Test

**Test Case Matrix**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Normal/**  **Abnormal** | **Blackbox/**  **Whitebox** | **Functional/**  **Performance** | **Unit/**  **Integration** |
| **CM** | Normal | Black | Functional | Unit |
| **SS** | Normal | Black | Functional | Unit |
| **SP** | Normal | White | Functional | Unit |
| **LM** | Normal | Black | Functional | Unit |
| **SM** | Normal | Black | Functional | Unit |
| **TM** | Normal | White | Functional | Unit |
| **EM** | Normal | White | Functional | Unit |