System Plan Test

**Agile Software Engineering and Devops**

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**System Test Plan:** Prediction of Heart Attack Using Machine Learning and Deep Learning

**1. Introduction**

**1.1 Purpose:**

The purpose of this System Test Plan is to ensure the quality and functionality of the "Prediction of Heart Attack" software system.

**1.2 Scope:**

This plan covers the testing activities for the Machine Learning and Deep Learning components of the project.

**2. Test Objectives**

2.1 Verify the accuracy and reliability of classification algorithms.

2.2 Validate the effectiveness of the Deep Learning model.

2.3 Ensure software performance with different parameter configurations. 2.4 Validate compliance with specified requirements.

2.5 Identify and address defects in the software.

**3. Test Environment**

**3.1 Software Under Test (SUT):**

Python

Relevant libraries and frameworks

Heart Attack Dataset





**3.2 Hardware:**

Suitable hardware for ML and Deep Learning computations.

**4. Test Scenarios**

**4.1 Machine Learning Algorithm Testing:**

**Test Scenario 1:** Decision Tree Algorithm

**Test Scenario 2:** Random Forest Algorithm

**Test Scenario 3:** SVM Algorithm

**Test Scenario 4:** Logistic Regression Algorithm

**Test Scenario 5:** KNN Algorithm

**Test Scenario 6:** Naïve Bayes Algorithm

**Test Scenario 7:** Parameter Tuning (various data sizes)

**4.2 Deep Learning Algorithm Testing:**

**Test Scenario 8:** Deep Neural Network Classification

**Test Scenario 9:**

● Parameter Tuning

● Number of neurons in each layer

● Number of epochs

● Number of hidden layers

● Activation functions

**5. Test Cases**

**Test Scenario 1: Decision Tree Algorithm**

● **Test Case 1.1:** Input heart attack data, execute Decision Tree algorithm. ● **Test Case 1.2:** Verify the accuracy and recall of the model.

● **Test Case 1.3:** Vary training and test data sizes, retest accuracy.

**Test Scenario 2: Random Forest Algorithm**

● **Test Case 2.1:** Input heart attack data, execute Random Forest algorithm.

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● **Test Case 2.2:** Verify the accuracy and precision of the model.

● **Test Case 2.3:** Vary training and test data sizes, retest accuracy.

(Repeat similar test cases for SVM, Logistic Regression, KNN, and Naïve Bayes algorithms)

**Test Scenario 8: Deep Neural Network Classification**

● Test Case 8.1: Input heart attack data, execute Deep Neural Network. ● Test Case 8.2: Vary the number of neurons in each layer, evaluate accuracy. ● Test Case 8.3: Increase the number of epochs, measure model performance. ● Test Case 8.4: Add hidden layers, assess model accuracy.

● Test Case 8.5: Change activation functions, record model performance. **6. Test Execution**

**6.1 Test Schedule:**

Testing activities will be carried out over a period of 2 Hours .

Each test scenario will be allocated a specific timeframe as follows:

Machine Learning Algorithm Testing 1 hour

Deep Learning Algorithm Testing 1 Hour

**6.2 Test Data:**

The Heart Attack Dataset has been obtained and preprocessed to ensure data quality and relevance.

Data will be divided into training and testing sets according to the requirements of each test scenario.

**7. Test Deliverables**

**7.1 Test Reports:**

Test reports for each test scenario will be generated upon completion.

These reports will include details on the executed test cases, observed results, accuracy metrics, and any issues identified during testing.

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**8. Defect Reporting**

**8.1 Defect Identification:**

Defects will be identified during test execution and logged in the project's defect tracking system.

Severity and priority levels will be assigned to each defect based on their impact on system functionality.

**8.2 Defect Resolution:**

The development team will be responsible for resolving defects.

Once fixed, defects will undergo retesting to ensure they have been effectively addressed. Verified fixes will be marked as closed in the defect tracking system.

**9. Exit Criteria**

Testing will be considered complete when the following conditions are met: Accuracy metrics for each algorithm meet or exceed predefined thresholds. All critical and high-priority defects are resolved and verified.

The software complies with specified requirements.

Test reports are generated and reviewed by the testing team and stakeholders.

**10. Conclusion**

The System Test Plan has been outlined to ensure thorough testing of the "Prediction of Heart Attack" software system.

**11. Approval**

The System Test Plan has been reviewed and approved by CVSN Reddy on September 7th **12. Appendix**

Heart.csv

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