***System Test Plan***

***for***

***Machine Learning in Diabetes***

***Version 0.01***

***Prepared By***

***Donna R***

1) **Test Plan Identifier**

DPI 0.01

2)  **References**

SRS document

3) **Introduction**

This is a Test Plan for the Diabetes Prediction System project. The focus of this project is to develop a system that predicts the likelihood of a patient developing diabetes using machine learning algorithms. The system will take input data from a provided CSV file and generate prediction results. The estimated time to complete the project is 2 days. Any delay in the development process or verification could have a significant effect on the test plan.

4) **Test Items**

* Data Preprocessing
* ML Model Training
* Diabetes Prediction
* Reporting and Visualization

5) **Software Risk Issues**

* Accuracy of the ML algorithms in predicting diabetes.
* Performance issues in real-time prediction.

6) **Features to be Tested**

* Ensure the correct integration of the ML model with the system.
* Verify the accuracy of the prediction results generated by the ML model.
* Test the generation of reports and visualizations to present prediction results.

7) **Features not to be Tested**

Not applicable

8) **Approach**

* Identify test scenarios and test cases based on the functional requirements.
* Execute the test cases using the ML model integration.
* Compare the actual results with expected results.
* Report any deviations or defects found during testing.

9) **Item Pass/Fail Criteria**

To input and check if all the functionality is working and the desired output is given

10) **Suspension Criteria and Resumption Requirements**

Testing may be suspended if critical defects or system failures are encountered that prevent further testing. Testing can be resumed once the defects are resolved or the system issues are fixed.

11) **Test Deliverables**

System test plan, test cases, test data, automation, test execution report, summary report, defects report

12) **Remaining Test Tasks**

not applicable

13) **Environmental Needs**

* Internet connection for accessing any external resources required for testing.
* Python and necessary ML libraries installed for running the ML model.

14) **Staffing and Training Needs**

2 people required to test the product

15) **Responsibilities**

* Developing and executing the test plan.
* Reporting defects and issues.

16)  **Schedule**

Start date of testing is 07-06-2023 to 10-06-2023 to ensure thorough coverage of test scenarios and adequate time for bug fixing and retesting.

17) **Planning Risks and Contingencies**

* Insufficient training data for the ML model, leading to inaccurate predictions.
* Delays in the development process affecting the testing timeline.
* Performance issues due to a large volume of patient records.

18) **Approvals**

given by product manager if the product functionality is working without any error

19) **Glossary**

SRS = software require specification

# **Test case**

1. *Test Case: Data Preprocessing*

Description: Verify that the input data is cleaned, normalized, and missing values are handled correctly.

Test Steps:

* Provide a test dataset with known cleaning, normalization, and missing value scenarios.
* Execute the data preprocessing module on the test dataset.

Expected Result: The input data should be cleaned, normalized, and missing values should be appropriately handled.

1. *Test Case: ML Model Training*

Description: Verify that the ML model is trained accurately using the provided dataset.

Test Steps:

* Provide a training dataset with known input features and corresponding output labels.
* Execute the ML model training process on the training dataset.

Expected Result: The ML model should be trained accurately and produce the desired prediction outcomes.

1. *Test Case: Diabetes Prediction*

Description: Verify the accuracy of the prediction results generated by the ML model.

Test Steps:

* Provide a test dataset with known input features.
* Execute the diabetes prediction process using the trained ML model on the test dataset.
* some test cases:
  + Test\_1 = Take 45 as glucose and 63 as blood pressure as input and calculated output required is 1 else it is fail
  + Test\_2 = Take 40 as glucose and 92 as blood pressure as input and calculated output required is 0 else it is fail
  + Test\_3 = Take 40 as glucose and 50 as blood pressure as input and calculated output required is 0 else it is fail (Negative test case)
  + Test\_4 = Take 40 as glucose and 200 as blood pressure as input and calculated output required is 0 else it is fail (Negative test case)
  + Test\_5 = Take 20 as glucose and -10 as blood pressure as input and calculated output required is 0 else it is fail (Negative test case)

Expected Result: The prediction results should accurately indicate the likelihood of a patient developing diabetes based on the input features.

1. *Test Case: Reporting and Visualization*

Description: Verify the generation of reports and visualizations to present prediction results.

Test Steps:

* Execute the reporting and visualization module using sample prediction results.
* Check the generated reports and visualizations for the accuracy and effectiveness of presenting the prediction results.

Expected Result: The reports and visualizations should effectively present the prediction results, including patient details and the predicted likelihood of developing diabetes.