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Project name: Machine learning model that predicts what kind of music people like.

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Software Engineering
Software Requirements Specification (SRS) Document

Project Name : Machine learning model

1.0 Introduction

1.1 Problem definition:

The Clint is music Production Company that runs an online music store to sell their music tracks and their music materials, and the store allows users to create account, the company is facing a problem of decreasing in the annual sales income, so they want to work on increasing it.

1.2 Problem solution:

The solution of this problem is to provide a machine learning model, to use it in making prediction of what kind of music people like, so it can improve the user experience by allowing the user to find what they need in the website easily and more faster.

1.3 The way that the solution will work:

As mentioned the music store allows users to create account and when users sings-up, the website ask them for their age and their gender, so based on that, the machine learning model will be feed by a sample data of an existing users, trying to learn a pattern from it to use this pattern to make prediction of what kind of music people like.

1.4 The way that the solution will fit the business objective:

By predicting what kind of music people like, the user experience we be improved, so the users will spend more time on the website, and that will allow the company to show more of its products and also more of "google ads", so that the annual sales income will increase.

2.0 User requirements definition:

2.1 Services provided to the user:

1. Finding what they need easily

2. Improving user experience by

2.2 Functional requirements:

1. The input given to the system: it will be the sample data sets of an existing users.

2. System behavior: the proposed model will do data preprocessing, data visualization and data analysis, to make prediction.

3. Algorithm used: the model will use the “decision tree algorithm” to make a prediction.

4. The output: it will be what kind of music people like according to their age and gender.

2.3 Non-Functional requirements:

1. Reliability: as business grows the system can handle it easily.

2. Performance: the system will be very fast because it does not need a powerful hardware to run it.

3. Supportability: the system will be supported by maintenance and updates easily, because it will be provided by the company’s software team.

4. Security: the system needs to be provided by security support from the IT center in the company to prevent any unauthorized access to the user data.

3.0 Glossary:

3.1 Machine learning:

Machine learning is an application of artificial intelligence (AI) that provides systems the ability to automatically learn and improve from experience without being explicitly programmed, and it used to make predictions.

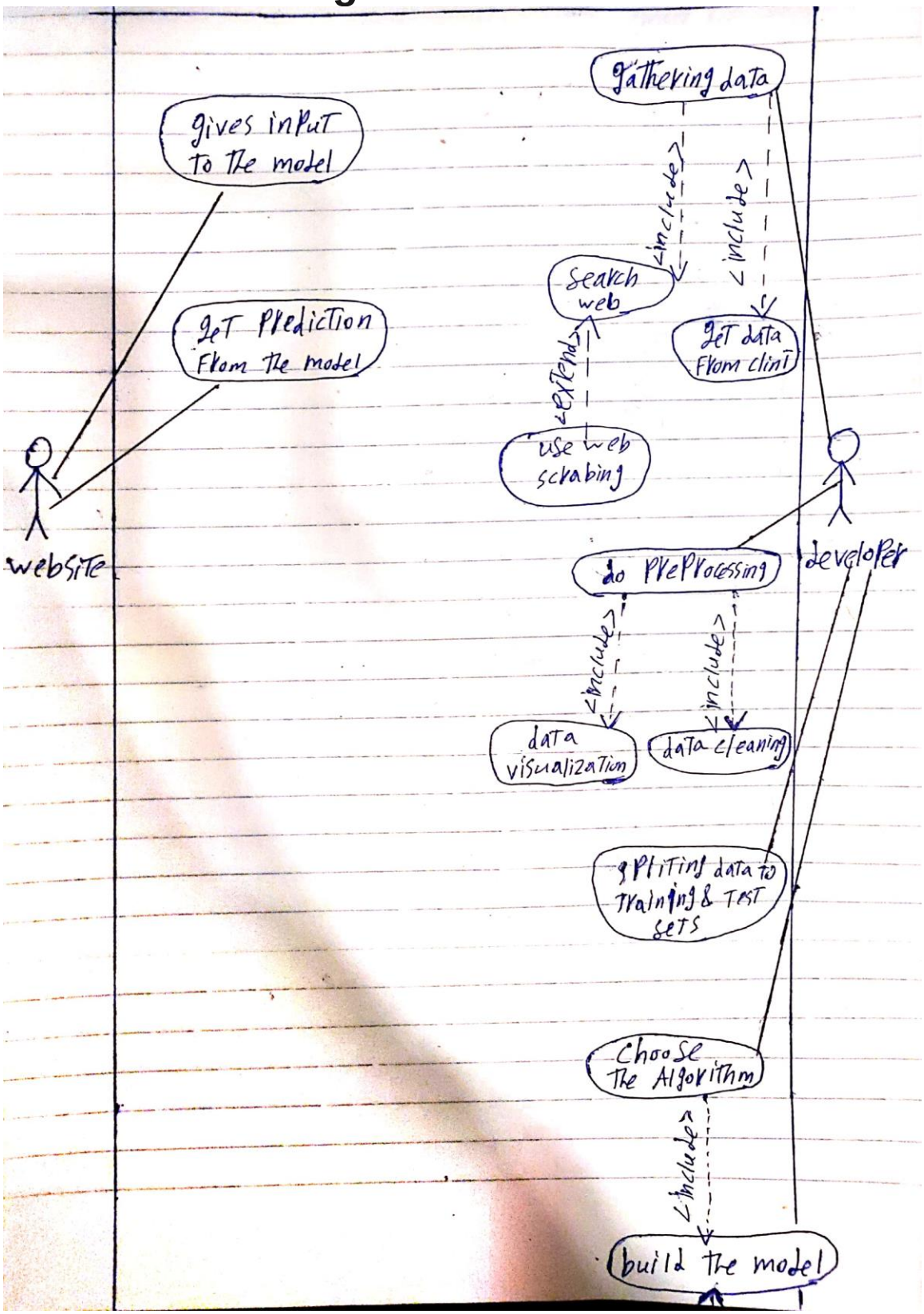
3.2 Decision tree:

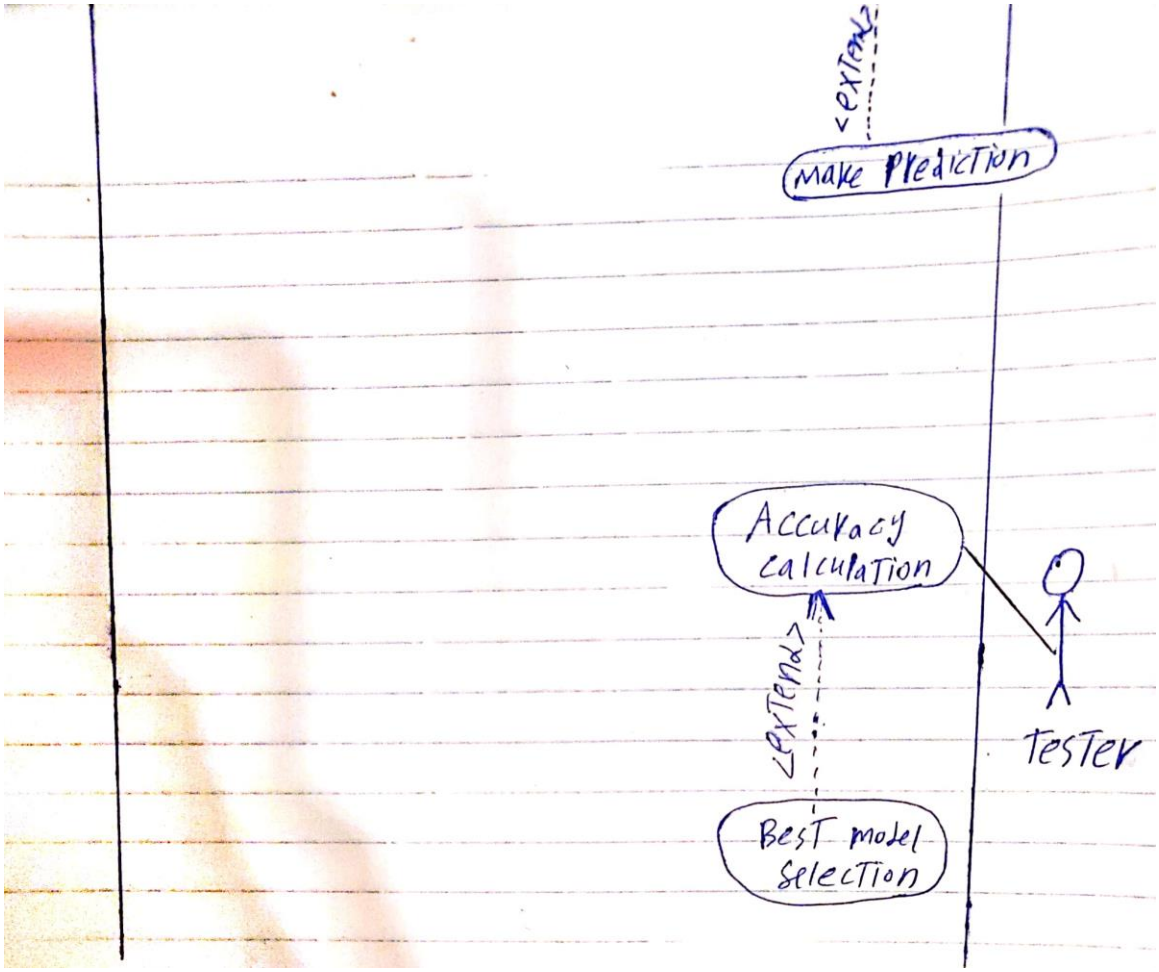
A decision tree is a decision support tool that uses a tree-like model of decisions and their possible consequences, including chance event outcomes, resource costs, and utility. It is one way to display an algorithm that only contains conditional control statements.

3.3 Accuracy:

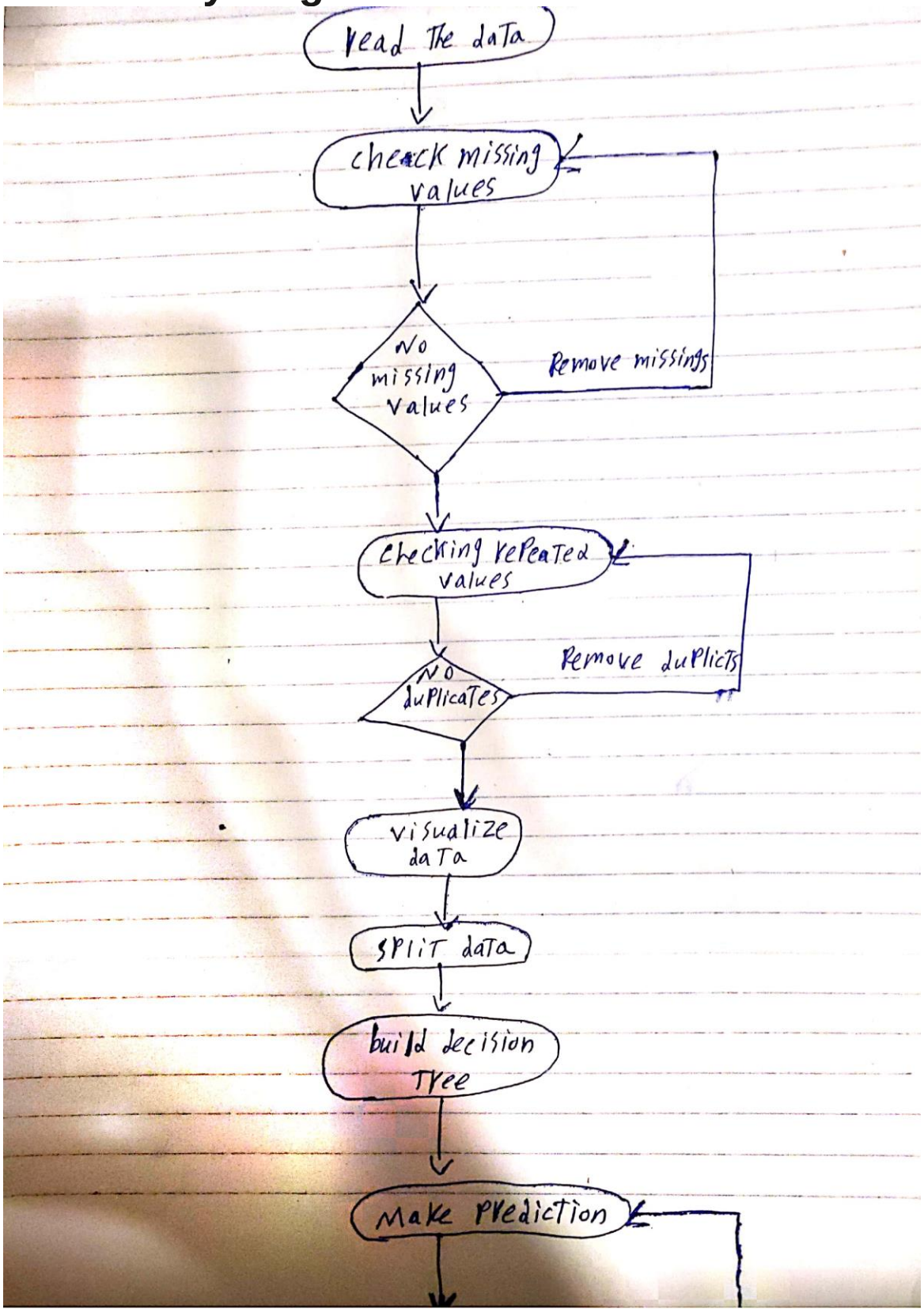
Accuracy is the number of correctly predicted data points out of all the data points. More formally, it is defined as the number of true positives and true negatives divided by the number of true positives, true negatives, false positives, and false negatives.

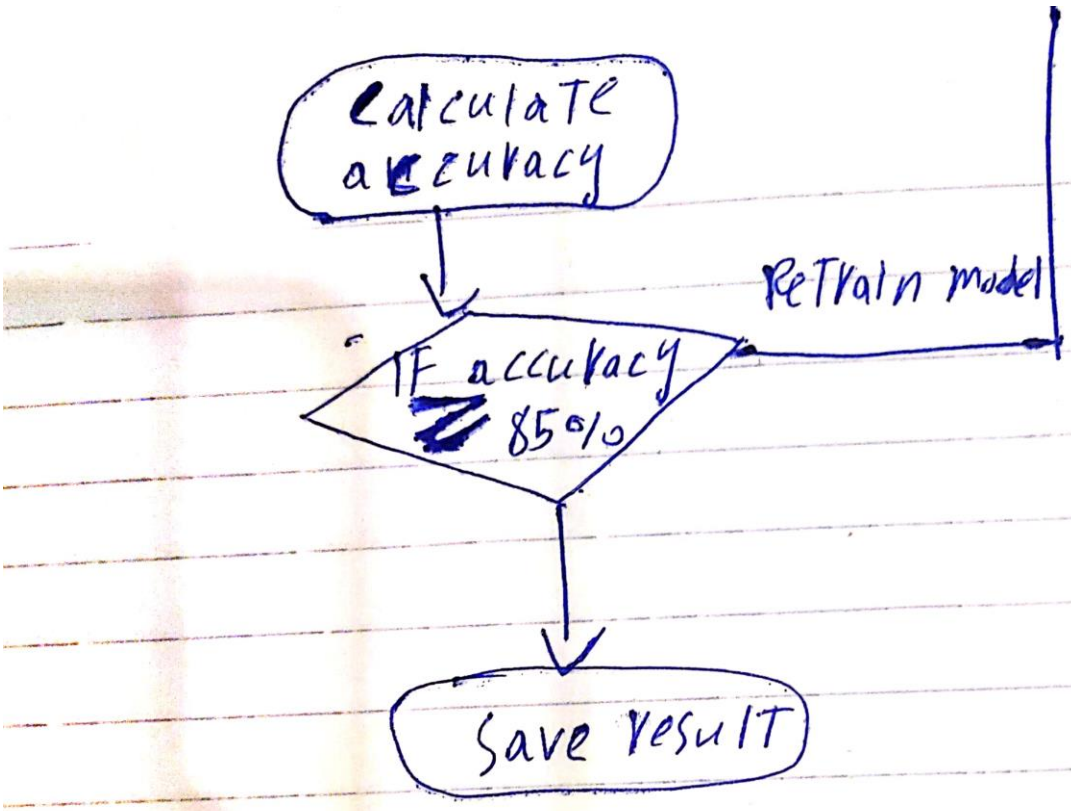
4.0 Use case diagram:



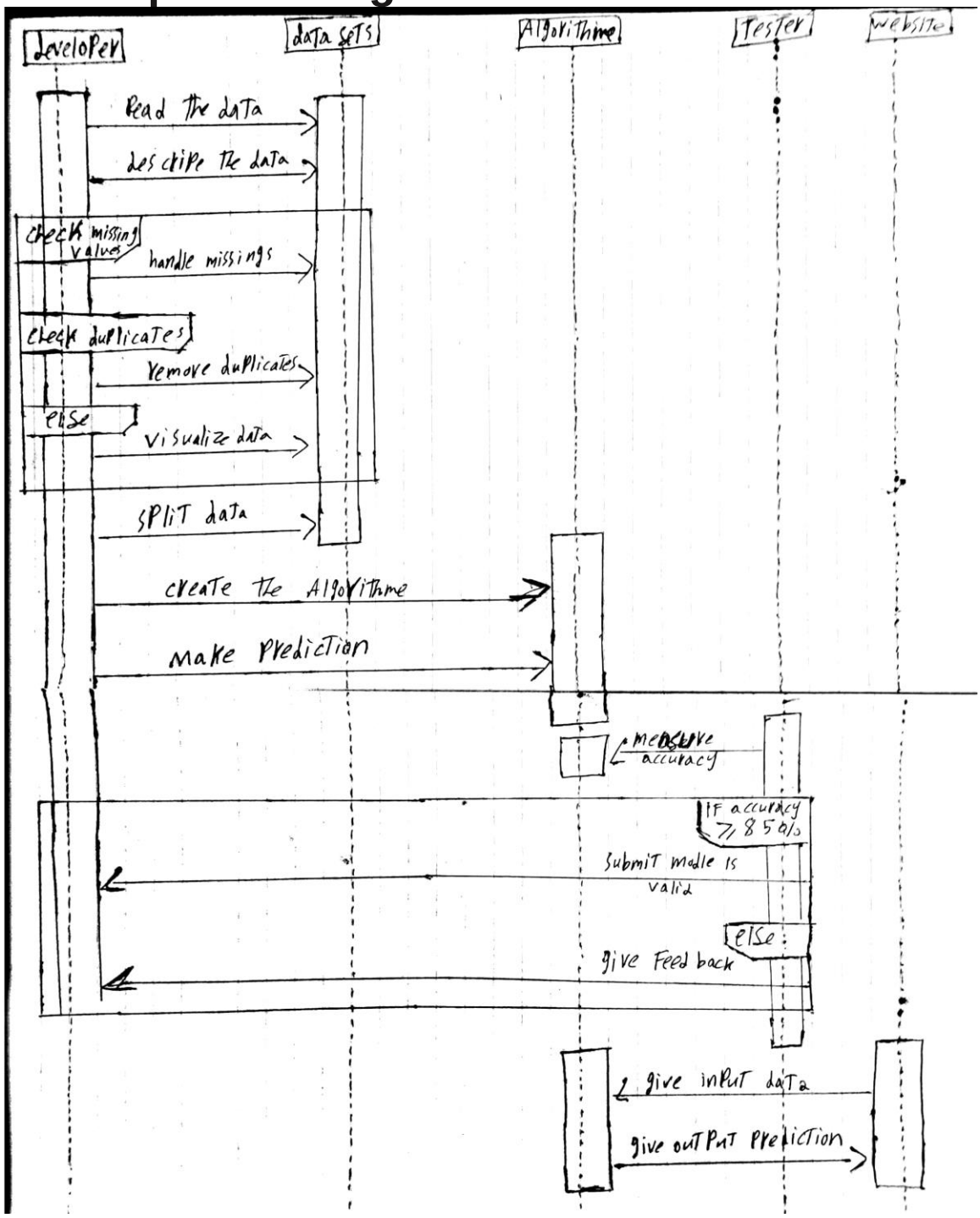

<extend>
Make Prediction
Accuracy calculation
<extend>
Best model selection
Tester

5.0 Activity diagram:

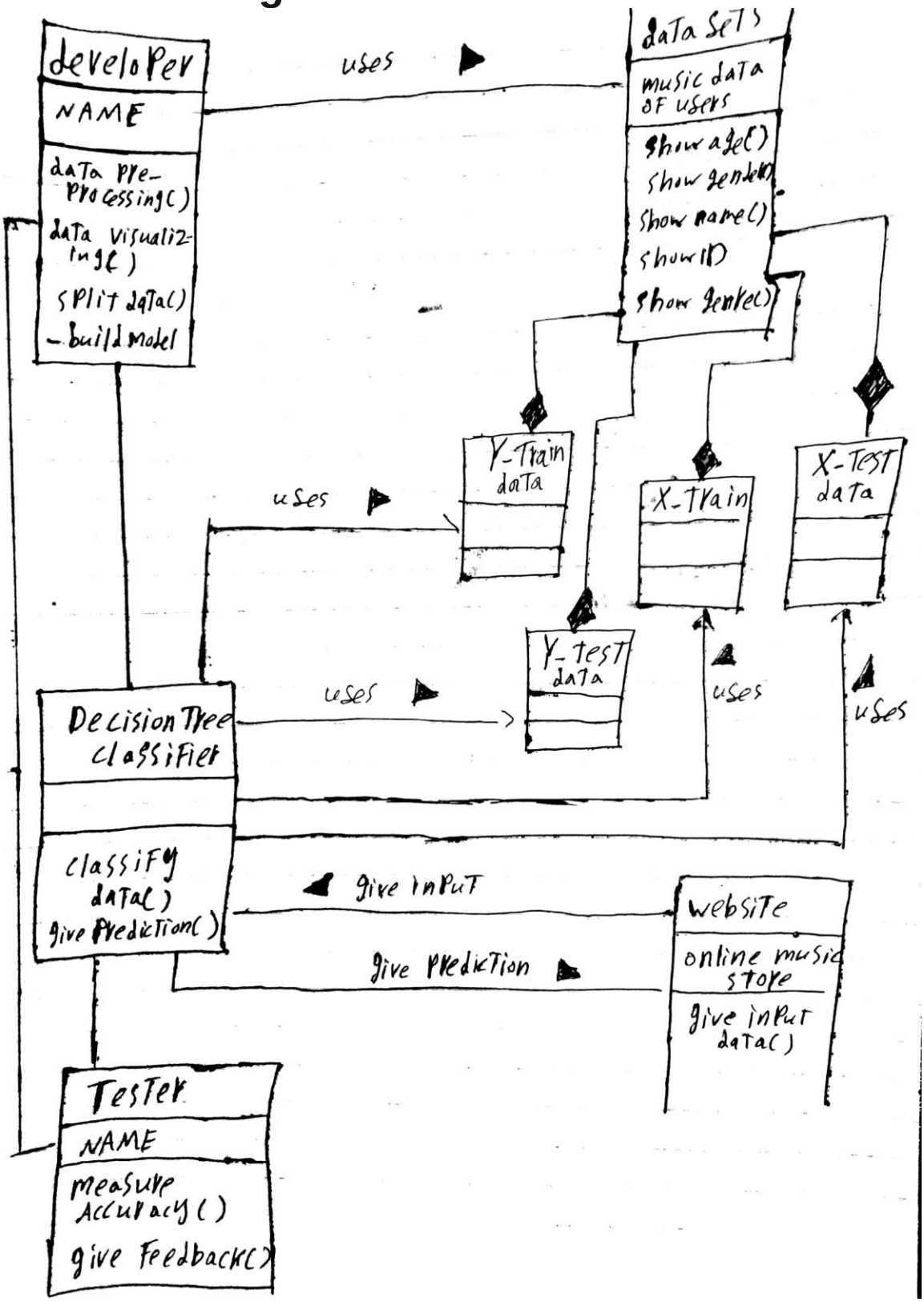



Calculate accuracy
Retrain model
IF accuracy ≥ 85%
Save result

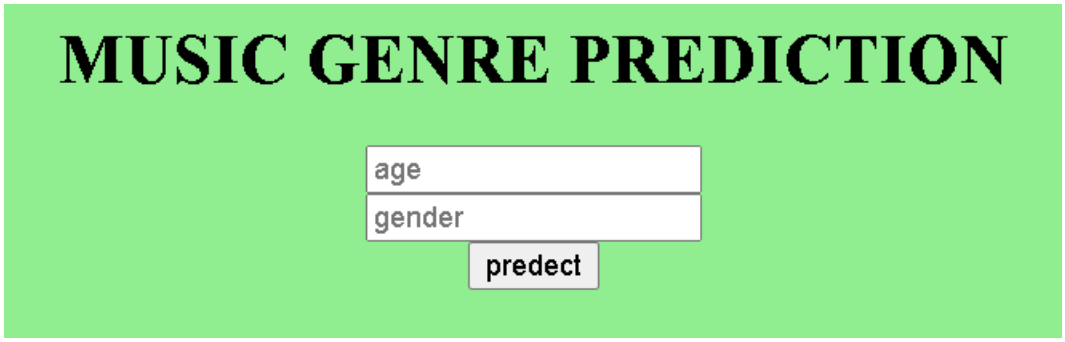
6.0 Sequence diagram:



7.0 Class diagram:



8.0 dummy user interface:



9.0 test cases:

9.1 First test:

In the first test the tester found that the accuracy of the model is 20% Because of error in the preprocessing stage, then he sent feedback to the developer to fix it.

9.2 Second test:

In the second test the tester found that the accuracy of the model is 75% because of a function that is used to save the correct accuracy result, then he sent feedback to the developer to fix it.

9.3 Third test:

In the third test the model was working, and there is no problem in the accuracy.

10.0 Model evaluation:

In the end the model is working as it should be, it gives an accuracy above 85%, which is the percentage that should be reached to use any machine learning model, and it has been deployed in the online music store with no problem, also the Clint is very satisfied of the achieved progress.