



AUTONOMOUS DYSDLEXIA EVALUATION SYSTEM

CPG 283

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Problem Definition

- Dyslexia is a learning disorder in which a person faces difficulty in reading, writing and fluency skills.
- Dyslexic child faces difficulty in recognizing similar types of alphabets, and they often get confused with the orientation of alphabets. Eg : b and d
- Pronunciation is one of the major problem faced by such children. They fail to distinguish b/w phonemes.
- Such children are inarticulate i.e. poor in fluency skills. This problem arises because they are slow to process relevant information.

Literature Survey

- Dyslexia is a learning disorder characterized by difficulty in reading, writing and speaking skills.
- Handwriting Recognition is the ability of a computer to convert handwritten text to digital format with the help of Artificial Intelligence.
- Speech Recognition is a process of converting speech to text with the help of Artificial Intelligence.
- HandTracking Module detects hands in captured video and converts it into matrix of desired co-ordinates.

Approved Objectives

- Automate the process of a dyslexia evaluation .
- To conduct tests which includes :
 1. Spelling orientation test
 2. Pronunciation test
 3. Object classification-based spelling orientation test
 4. Color recognition-based fluency test
- Increase the efficiency of Dyslexia evaluation process and keep a track record of the progress.
- Provide a personalized remote-based solution that helps to evaluate Dyslexia.

Project **Scope**

The scope of the Autonomous Dyslexia Evaluation System includes:

The software consists of website that acts upon.

- Provide a personalized remote-based solution and helps to monitor the progress of the Dyslexic subject.
- The system can be deployed in special-abled (slow learners) schools.
- Any registered person will be able to access all the tests and his/her previous track records.



Current Progress

- All modules of Spelling Orientation Test which includes Handtracking module and Handwriting Recognition module have been developed.
- Object Classification Test has also been developed.
- Web Interface for User is ready.
- Pronunciation Test and Rapid Color Naming Test are under development.
- Progress Report Generation is under development.

Future Scope

FEATURES TO BE ADDED

- **Decoding** : Decoding is the ability to read unfamiliar words by using letter-sound knowledge, spelling patterns and chunking the word into smaller parts, such as syllables. Decoding tests should use nonsense words (words that look like real words but have no meaning, such as frut or crin).
- **Reading comprehension** : Typically, children with dyslexia score lower on tests of reading comprehension than on listening comprehension because they have difficulty with decoding and accurately or fluently reading words.
- **Automaticity/fluency skills** : Children with dyslexia often have a slow speed of processing information (visual or auditory). Tasks measure Naming Speed (also called Rapid Automatic Naming) using sets of objects, letters, and numbers can be introduced with our color naming test.

Tools and Technologies

Programming Languages

Python , JavaScript

Python Packages

OpenCV, Tensorflow, Mediapipe

Frontend Frameworks

React JS

Backend Frameworks

Node JS, Express JS, Flask

IDE

Visual Studio Code , PyCharm

UML Tools

LucidChart

Version Control

Git, GitHub

Cloud Tools and Services

Google Collab, AWS

COST ANALYSIS

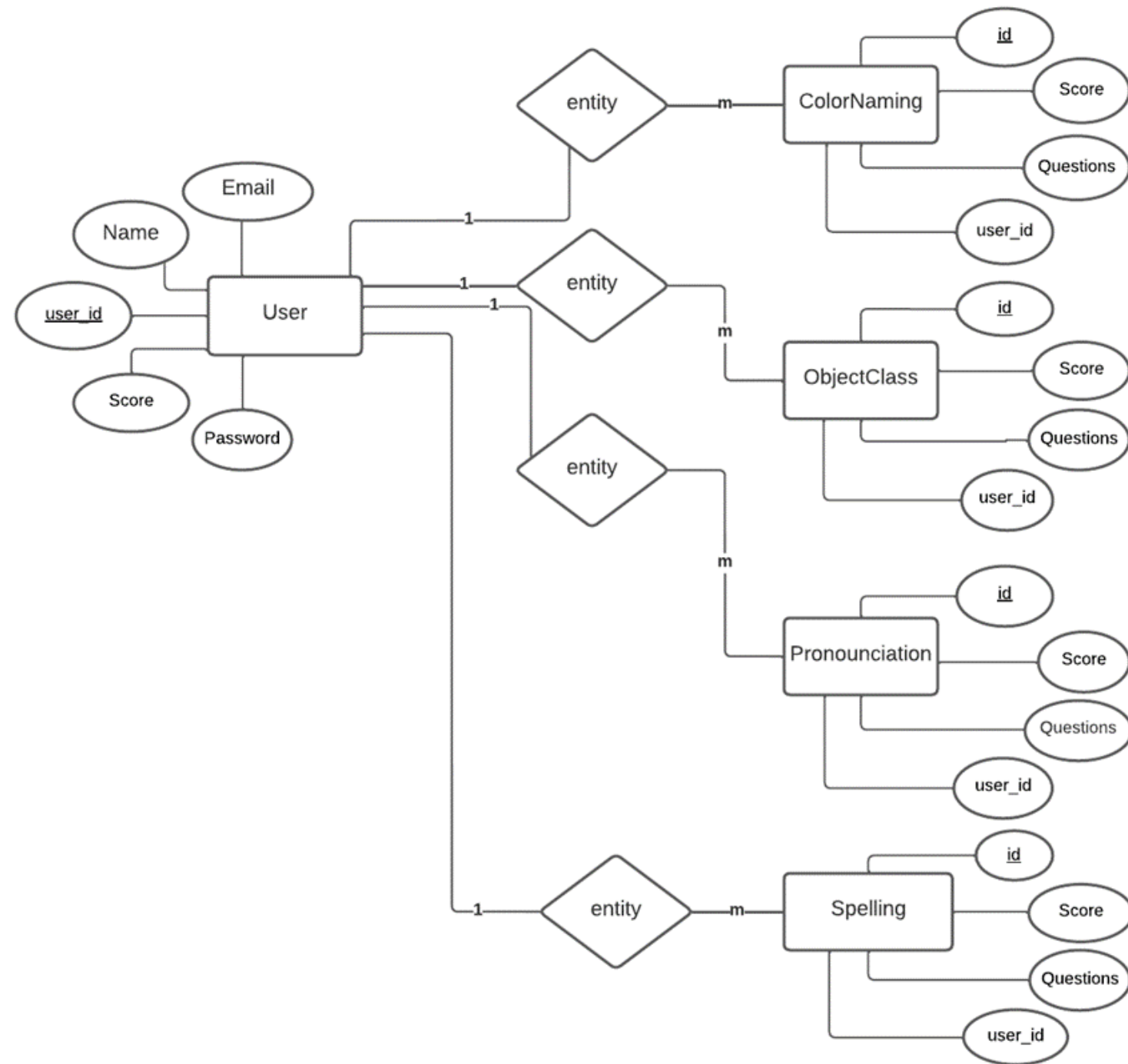
S No.	Service	Cost (INR)
1.	Domain Name	300
2.	EC2 g4dn.xlarge Instance (AWS) (For Testing purposes only)	500 (5 Days Reserved)
3.	Google Collab Pro Account (For Training Required Neural Networks)	1600
	Total Estimated Cost	6900



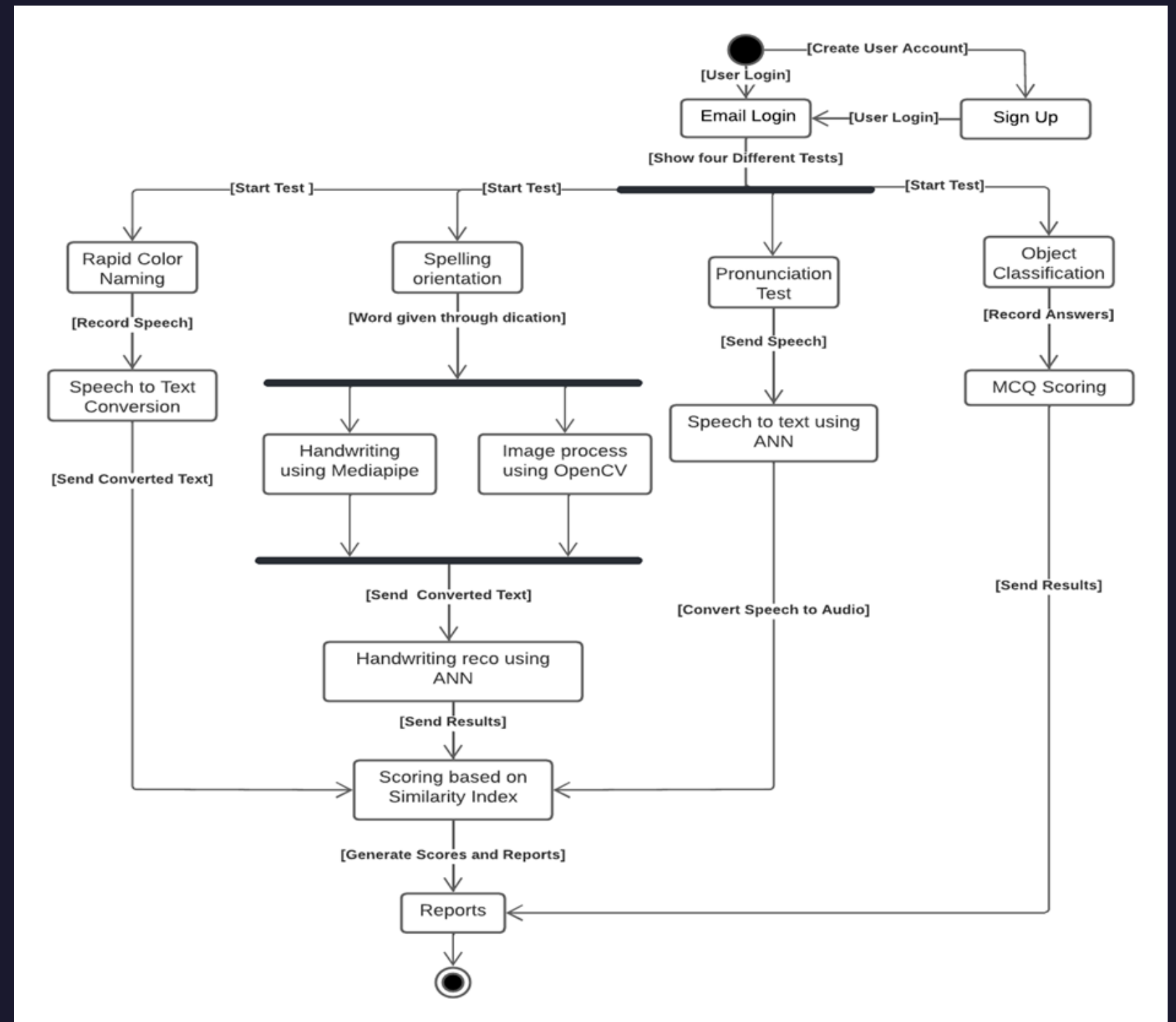
Project Outcomes

- Evaluation of Dyslexia –Automate the process of dyslexic subject's evaluation through various tests specially designed for them.
- Track record - A track record of the entire test history of the taker will be maintained. This record will help analyze the progress of the child after each test.
- No supervision – The tests will not require supervision by an adult. Each test will be designed in such a way that child will easily understand how to proceed and will not face any trouble while taking it.
- Minimal interface – The evaluation system will be designed while acknowledging the targeted age group.

UML Diagrams

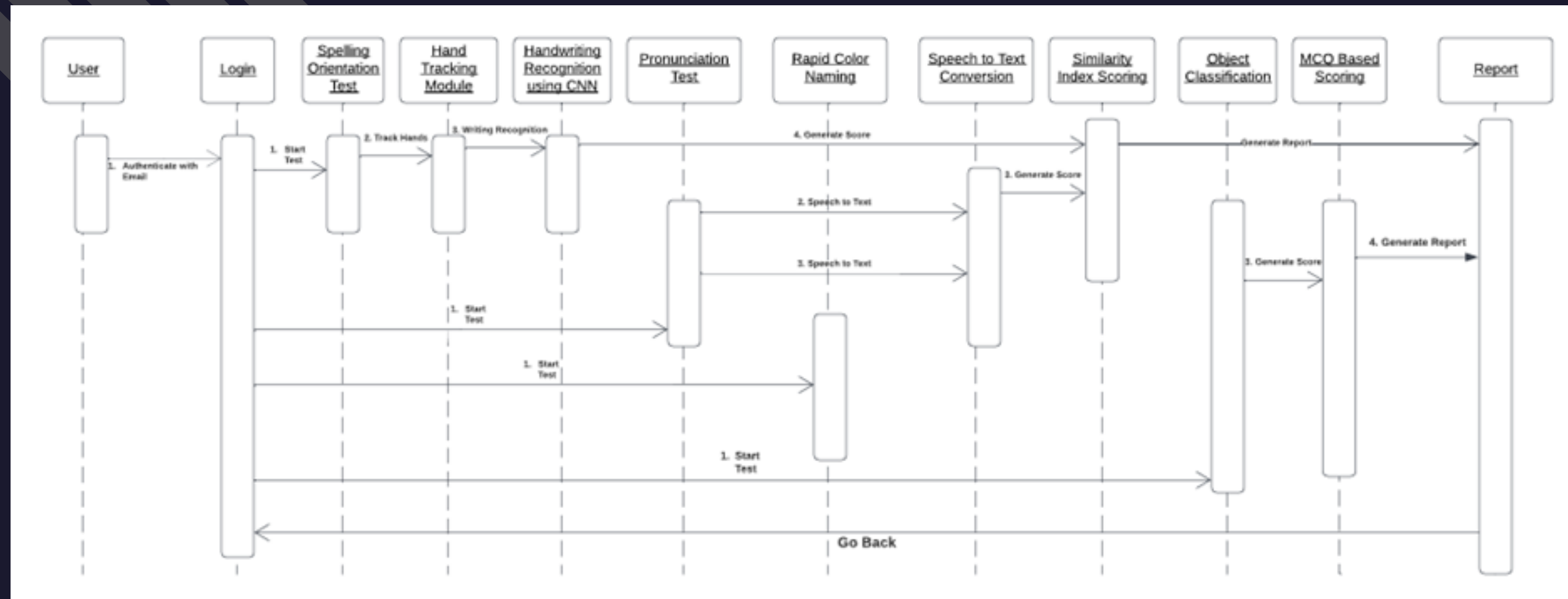


ER Diagram

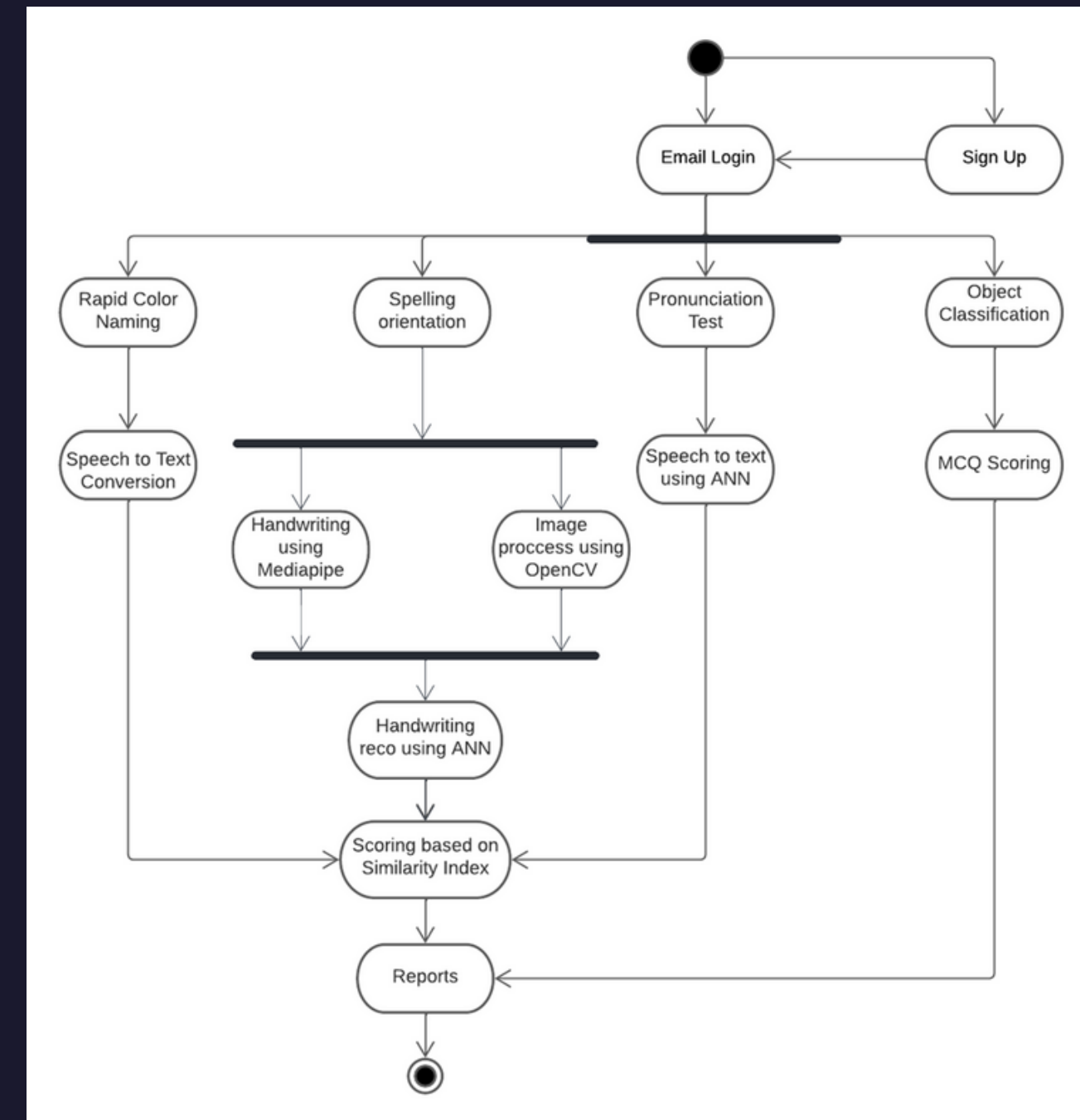


State Chart Diagram

UML Diagrams

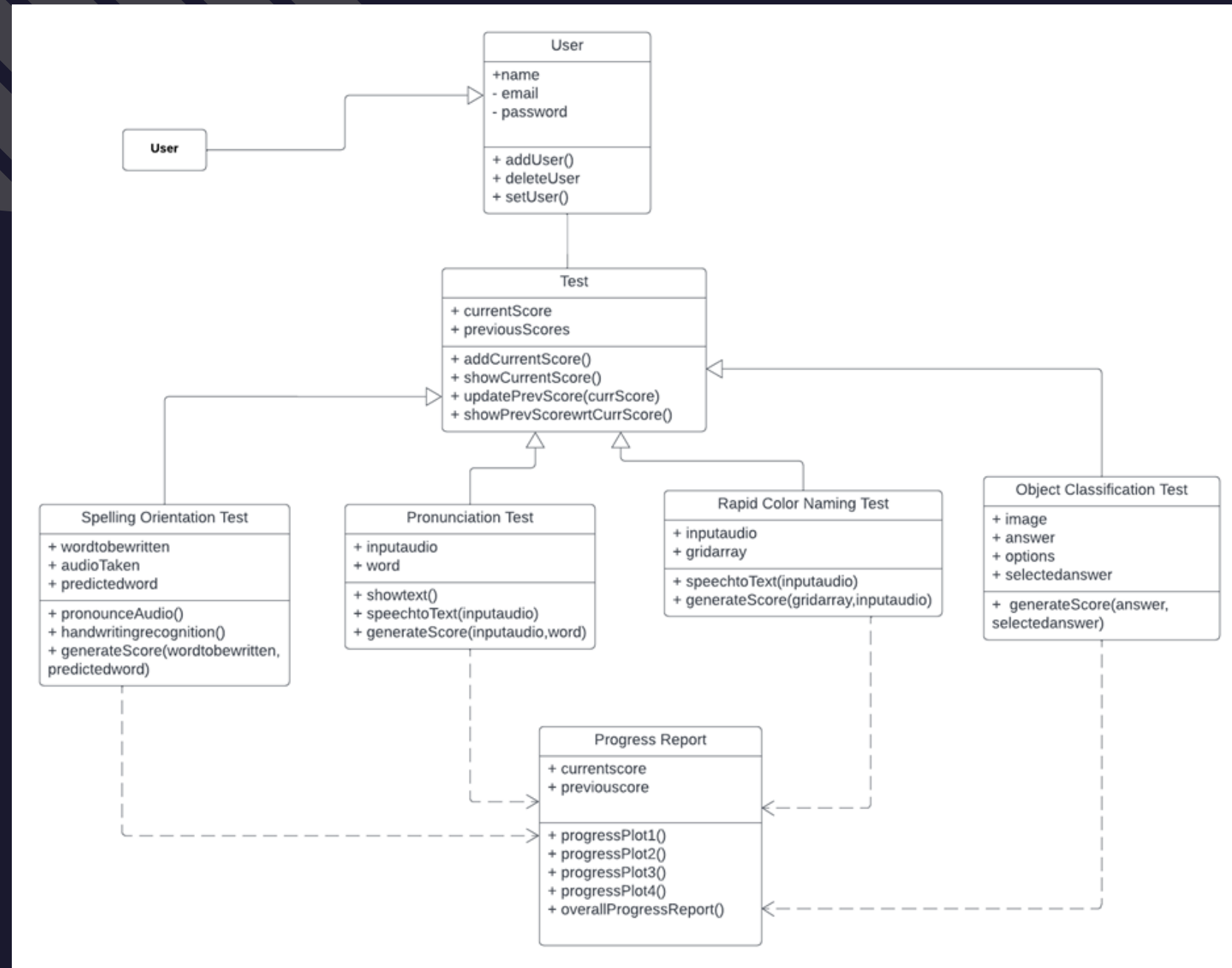


Sequence Diagram



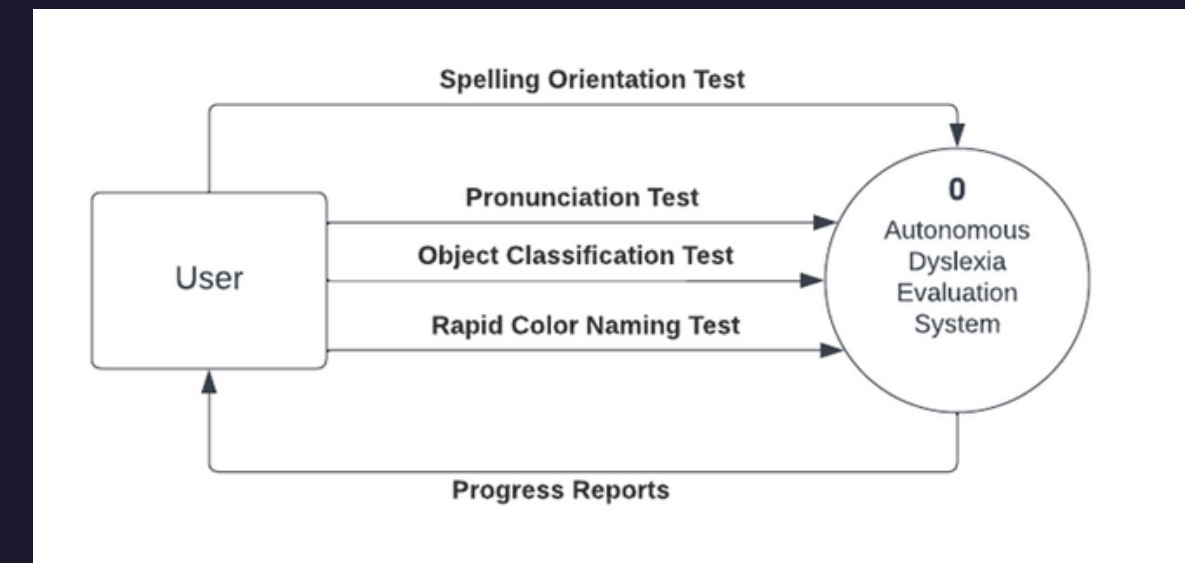
Activity Diagram

UML Diagram

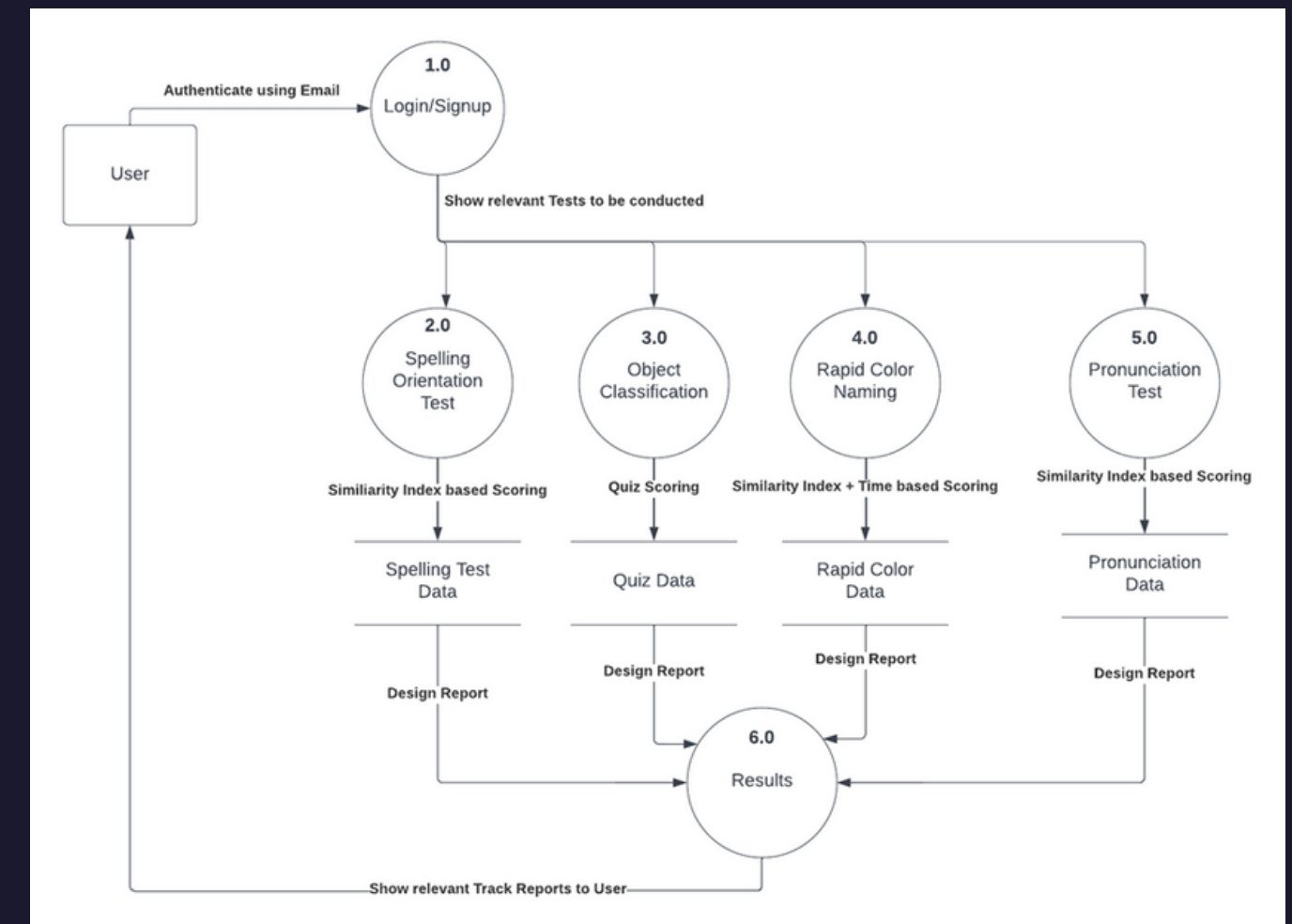


Class Diagram

Data Flow Diagrams



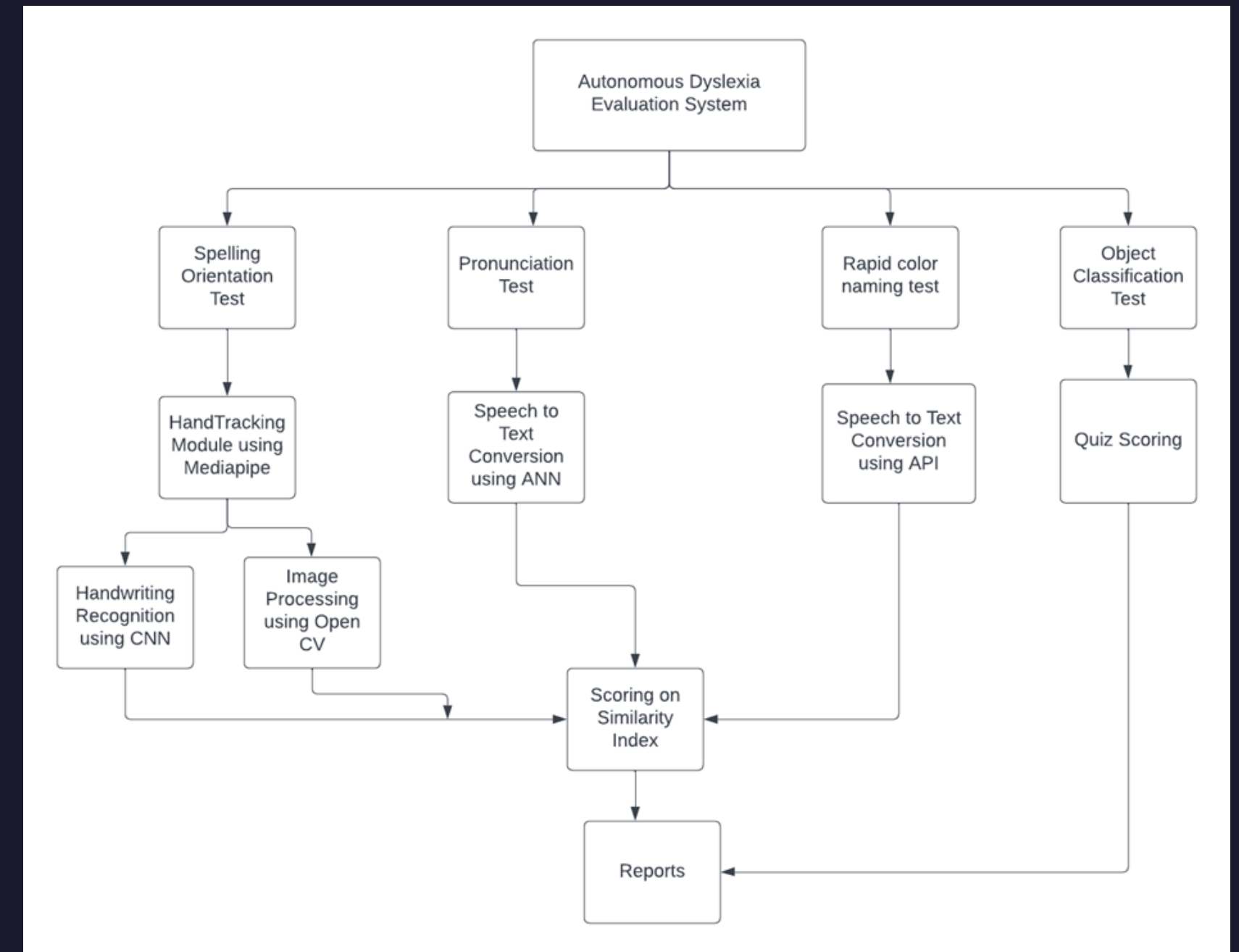
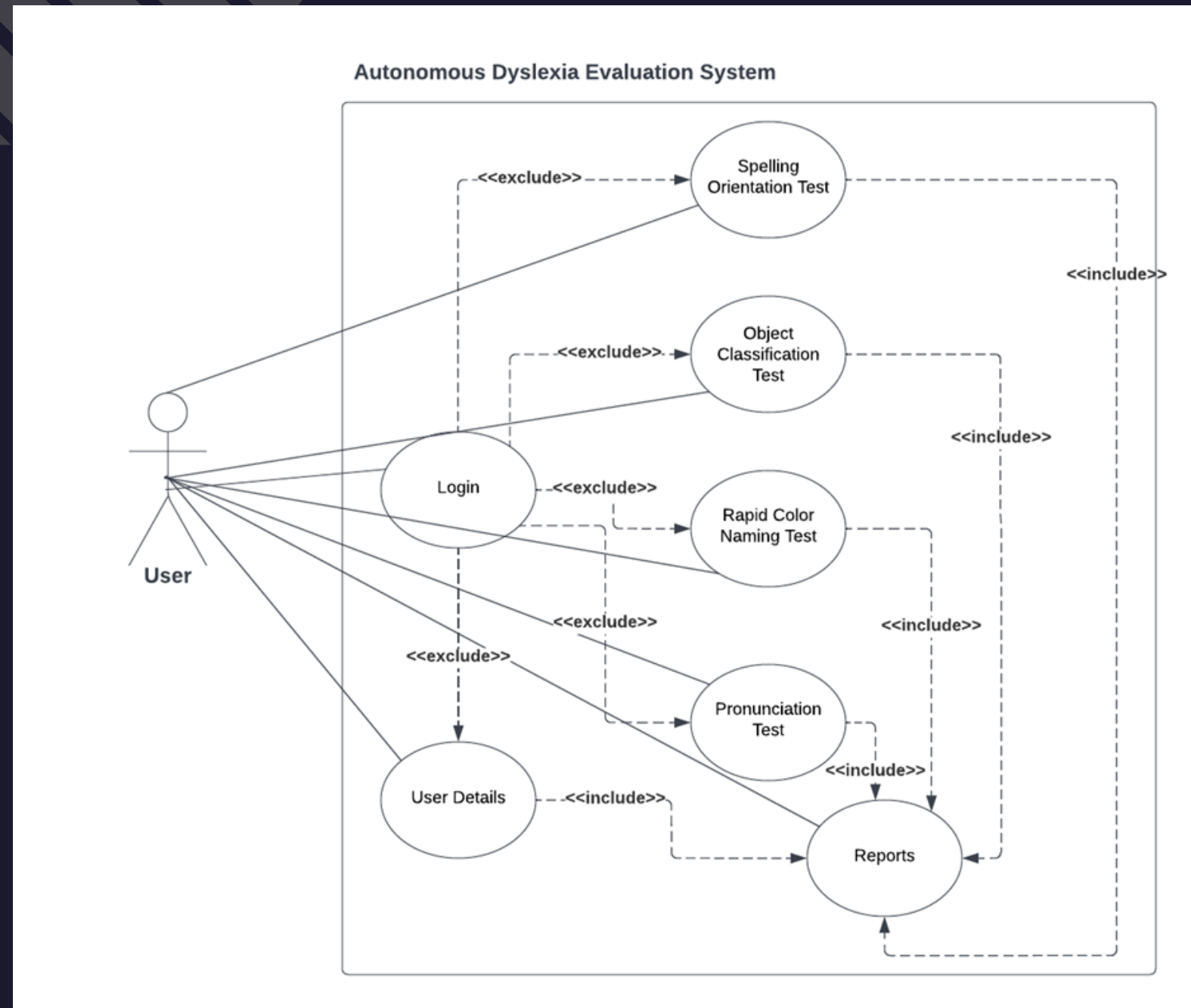
DFD Level 0



DFD Level 1

Use Case Diagram

Block Diagram



CONTRIBUTION OF EACH MEMEBER

Kashish

UML Diagram , Front end, Backend, Database, ,Software Requirements Specification

Paras Bakshi

Deep Learning model on handtracking recognition, Documentation, Data Collection

Sanidhiya

Deep Learning model on handwriting recognition, Documentation, Cost Analysis

Shreya

UML Diagram , Front end, Backend, Literature Survey, ,Software Requirements Specification

THANK YOU