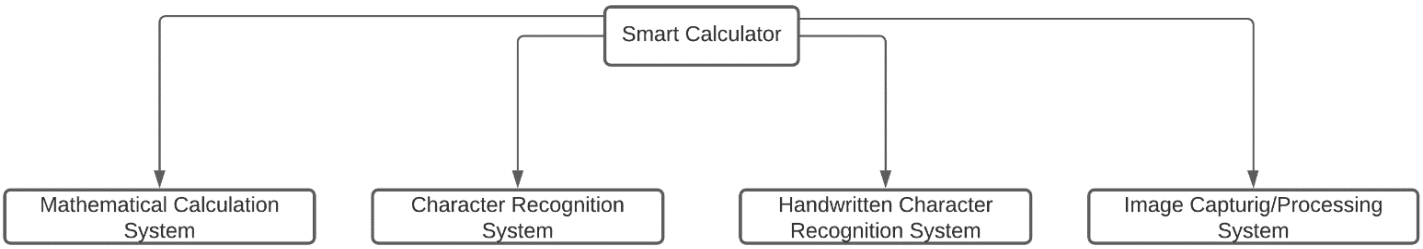
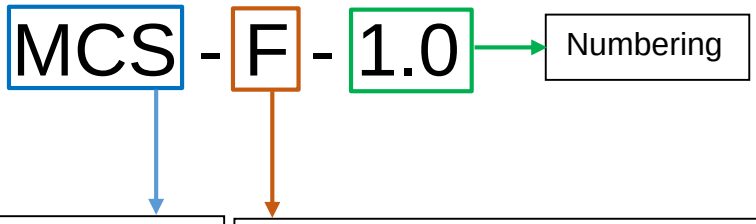
1. Artefact

1.1. FDD



1.2. SRS Legend

Legend



Sub Systems:

MCS : Mathematical Calculation System

CRS : Character Recognition System

HCS : Handwritten Character Recognition System

IPS : Image Processing System

Types of Requirements:

F : Functional Requirements

NF : Non-Functional Requirements

UR : Usability Requirements

1.3. SRS Table

Requirement Code	Requirement Description
MCSF **1.0**	The system should use the built in ALU to perform arithmetic calculations.
MCSNF 1.1	The system should provide the result in less than 1.5 seconds.
MCSNF 1.2	The system should follow BODMAS rule for calculations.
MCSUR 1.1	The system should have “All Clear” button to reset the entry.
MCSUR 1.2	The system should have “Clear Entry” button to erase the latest entry.
MCSUR 1.3	The system should display result in bigger font than the input.
MCSF **2.0**	The system should be able to perform scientific calculations.
MCSNF 2.1	The system should be able to point out the error if any occurs.
MCSNF 2.2	The scientific notations should be placed separately.
MCSF **3.0**	The system should keep records of the calculations history.
MCSNF 3.1	The system should display maximum five history records.
MCSNF 3.2	The system should have clear history option.
MCSUR 3.1	The system should have black background with white text color.
CRSF **1.0**	The system should recognize numbers as well as mathematical notations.
CRSUR 1.1	The notations should be clear and familiar to the users.
CRSF **2.0**	The system should recognize characters with noises as well.
CRSNF 2.1	The system should recognize the characters in less than 2 seconds.
HCSF **1.0**	The system should recognize hand written characters.
HCSNF 1.1	The system must have handwritten accuracy over 80%.
IPSF **1.0**	The system should be able to capture image to perform calculations.
IPSNF 1.1	The system should use mobile camera to capture the image.
IPSNF 1.2	The system should capture the in 720*720 resolution.
IPSNF 1.3	After capturing the image there should be crop option.
IPSNF 1.4	There should be save option for image.
IPSUR 1.1	There should be camera icon to switch between standard and scanning calculator.
IPSF **2.0**	The system should be able to perform calculations on images from gallery.
IPSNF 2.1	While importing, the images should be shown from latest to old.
IPSNF 2.2	While importing only one image should be selectable.
IPSUR 2.1	The selected image should be faded.

1.4. System Modeling

1.4.1. Context Modeling

1.4.1.1. Use Case Diagram

- Use Case Diagram for Basic Calculation System

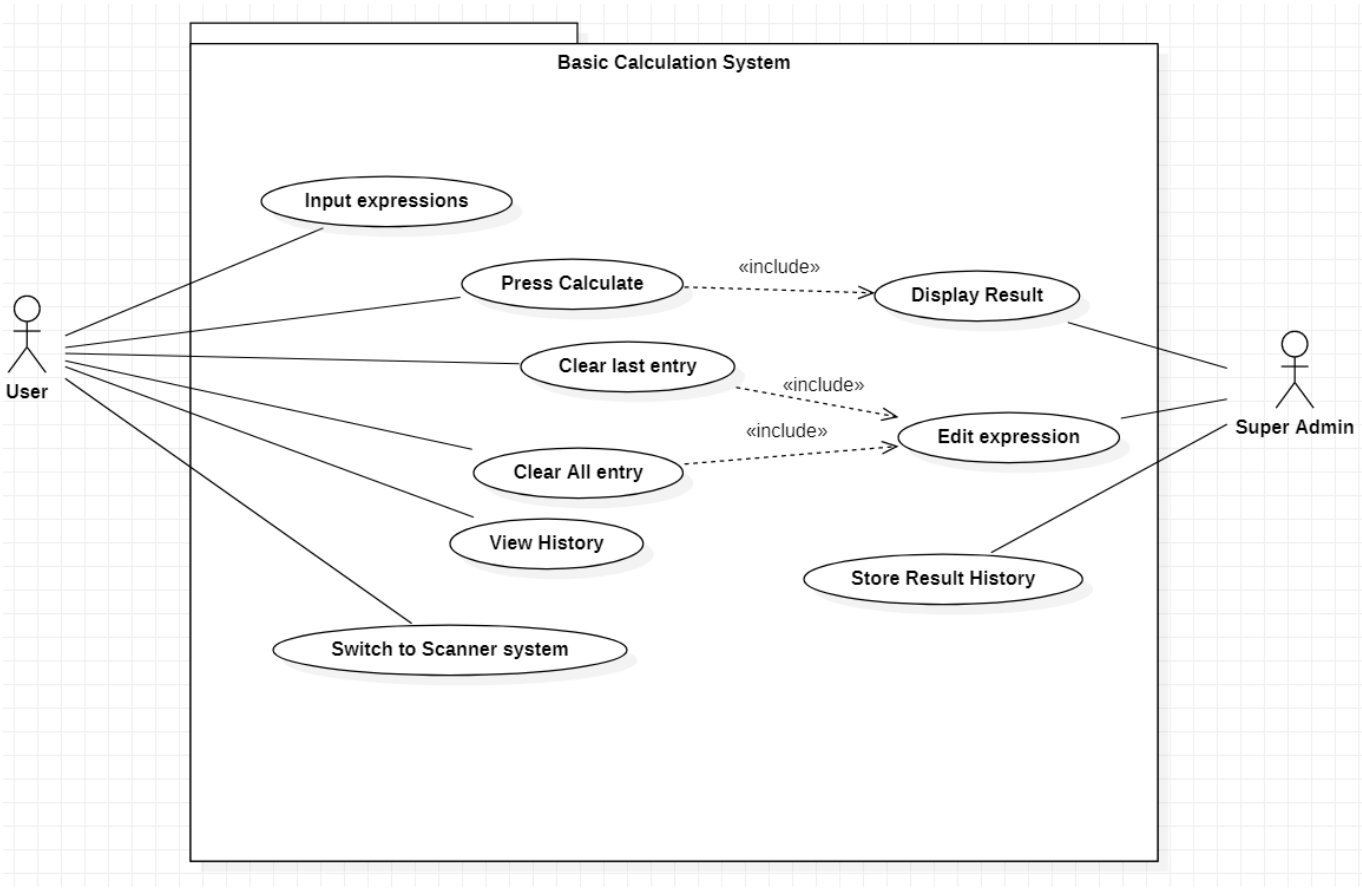


Figure 1: Use Case Diagram for Basic Calculation System

- Use Case Diagram for Image Capturing System

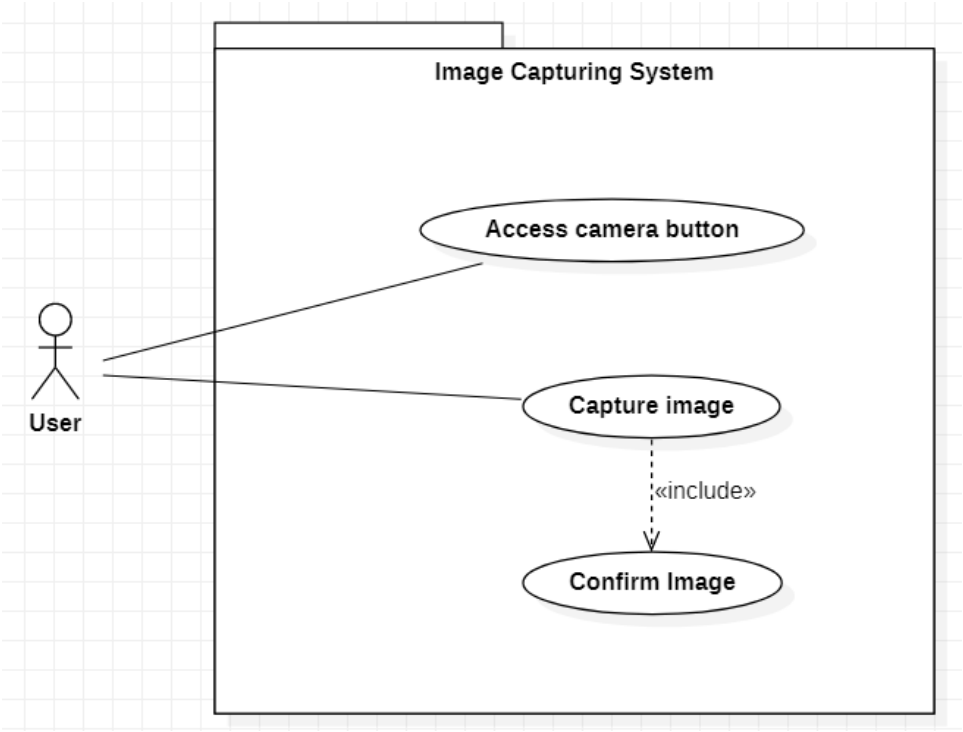


Figure 2: Use Case Diagram for Image Capturing System

- Use Case Diagram for Character Recognition System

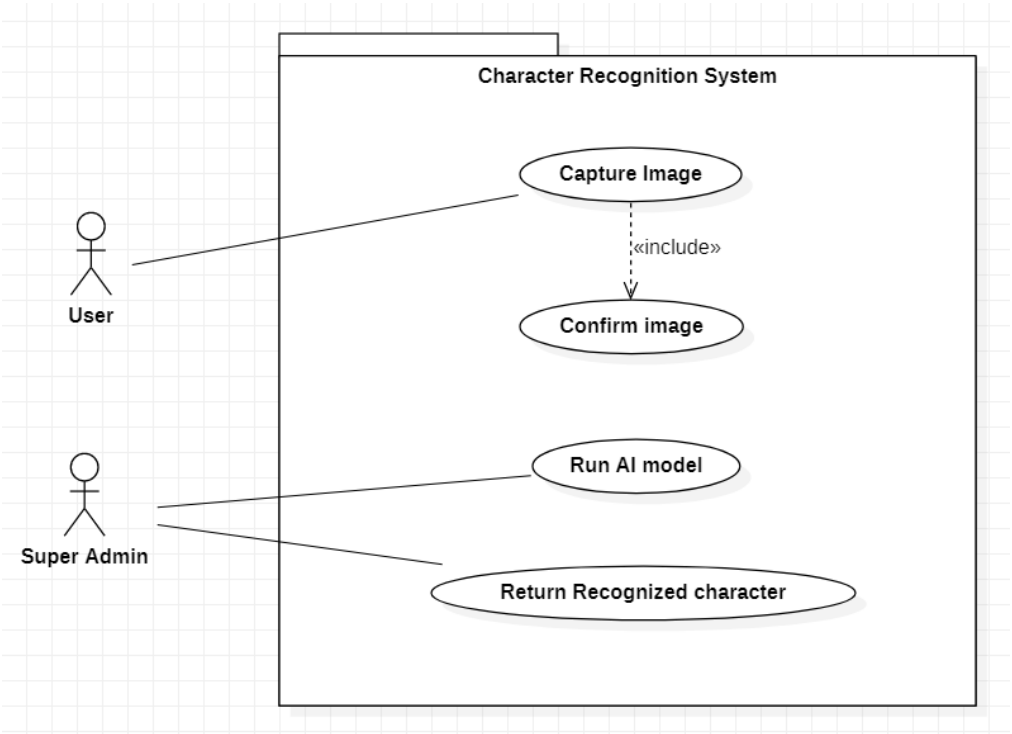


Figure 3: Use Case Diagram for Character Recognition System

1.4.2. Structural Modeling

1.4.2.1. Class Diagram

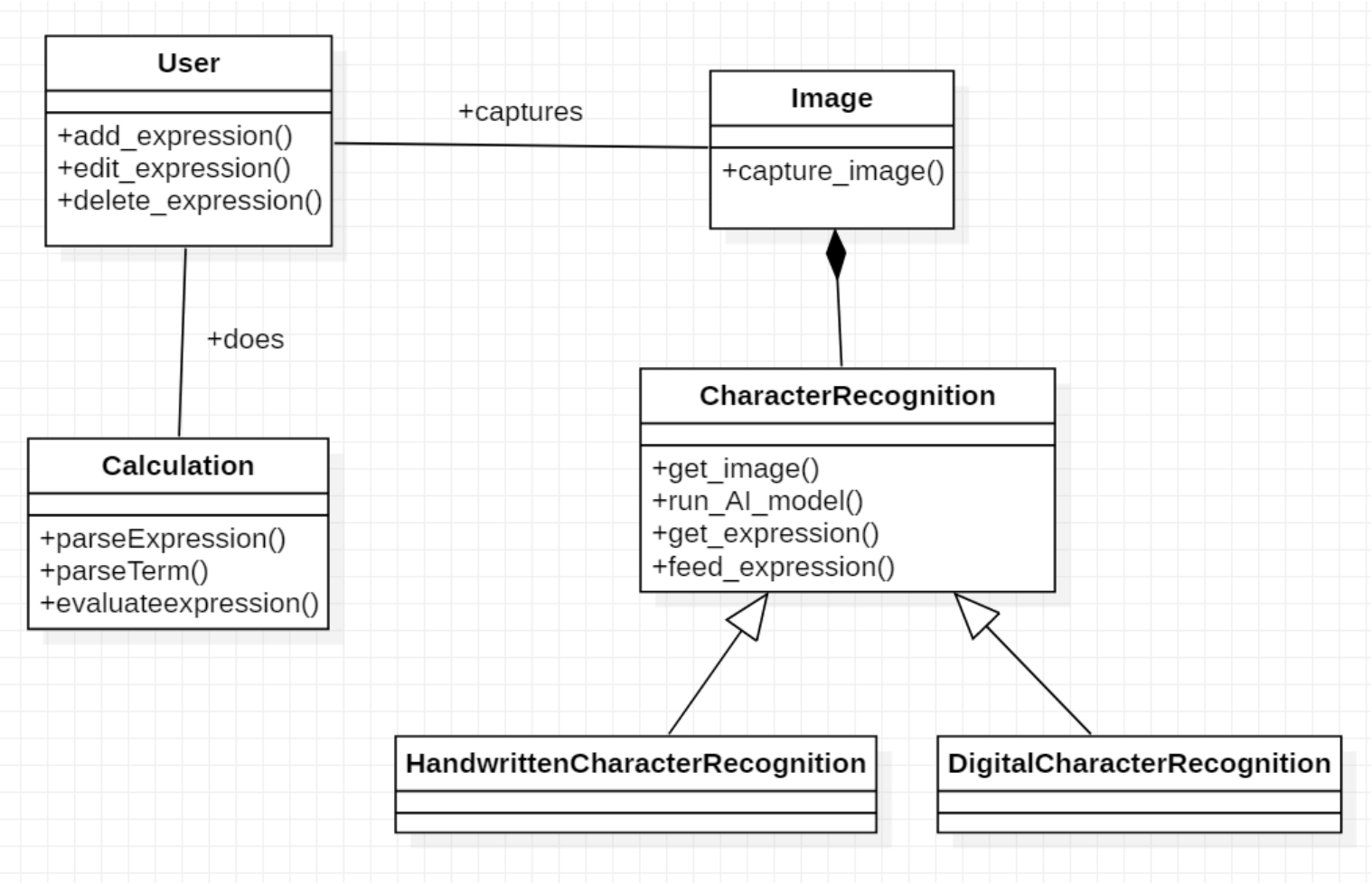


Figure 4: Class Diagram

1.4.3. Process Modeling

1.4.3.1. Context Diagram

- Context Diagram for Character Recognition System

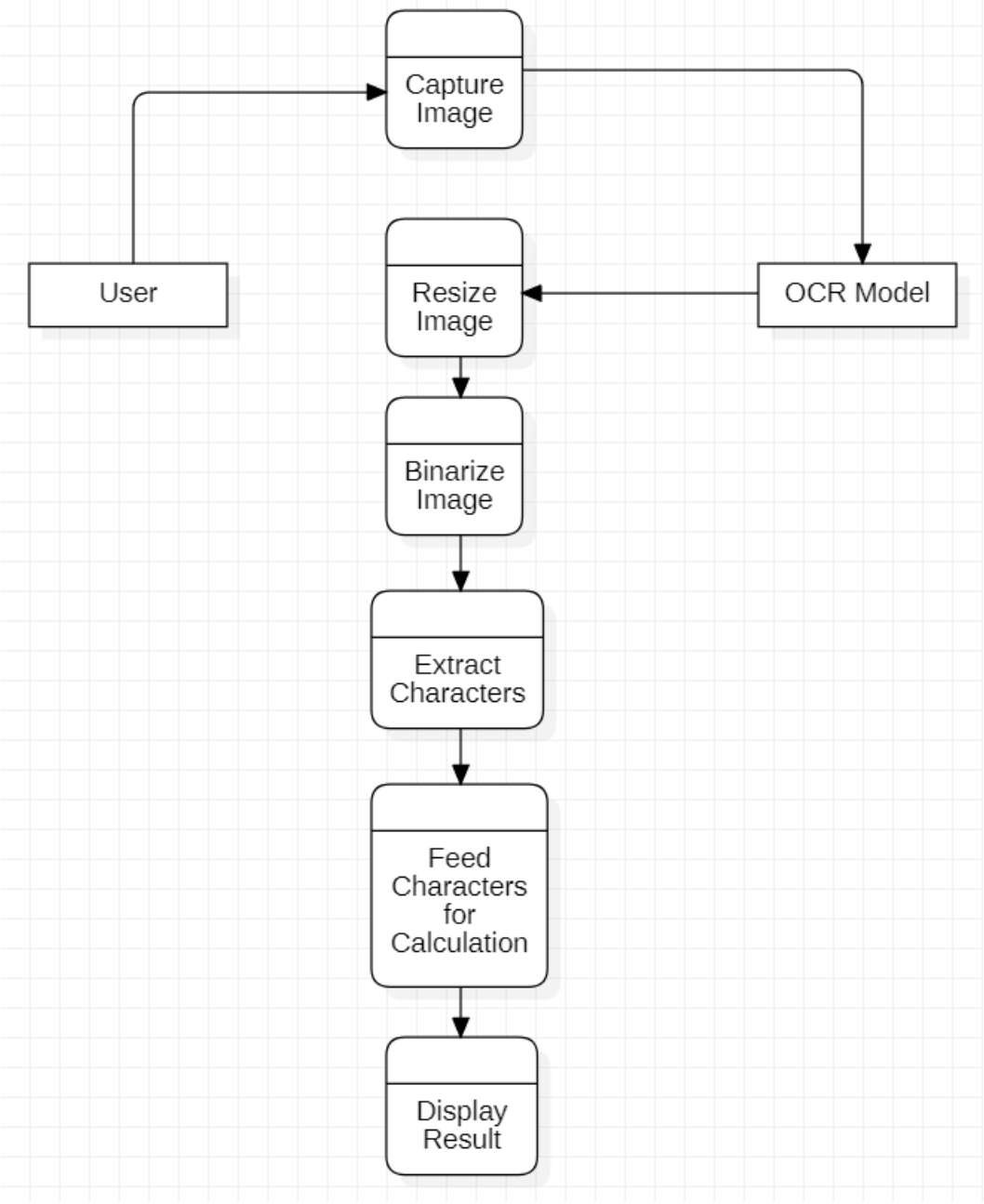


Figure 5: Context Diagram for Image Capturing System

- Context Diagram for Character Recognition System

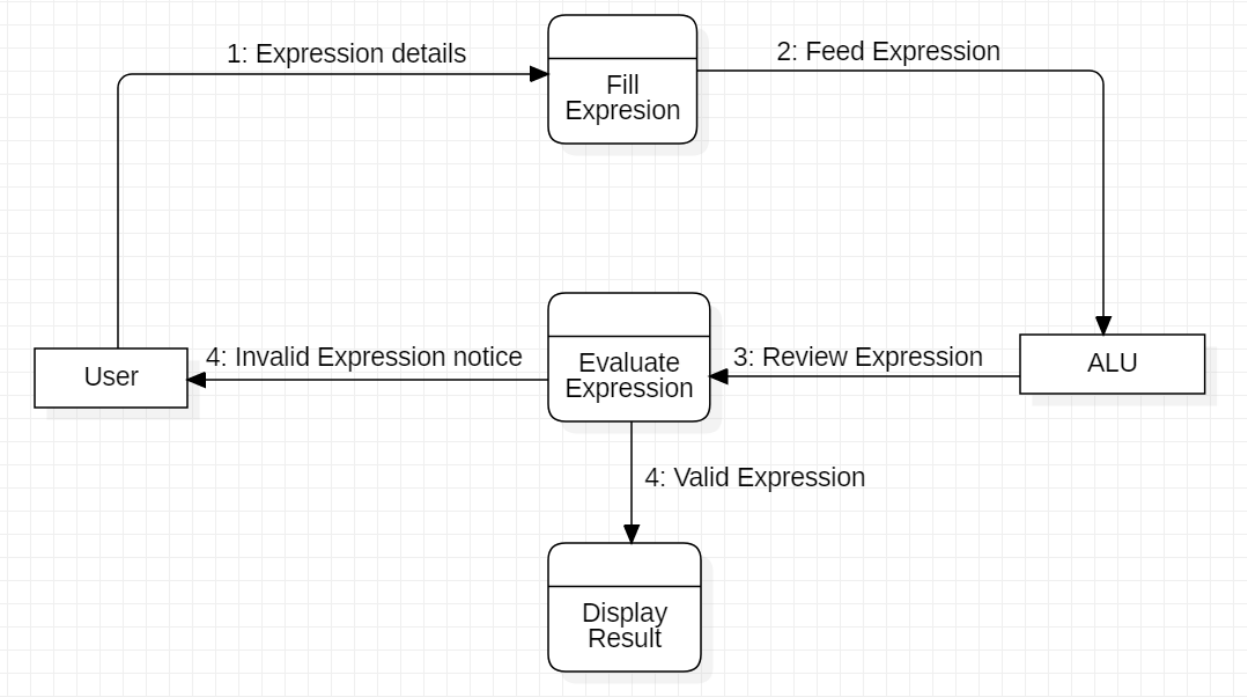


Figure 6: Context Diagram for Character Recognition System

1.4.4. UI Model

1.4.4.1. Wireframe

Figure 11: Main Screen

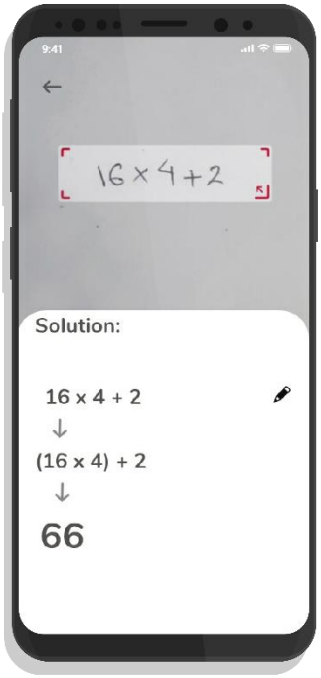


Figure 9: Solution Screen

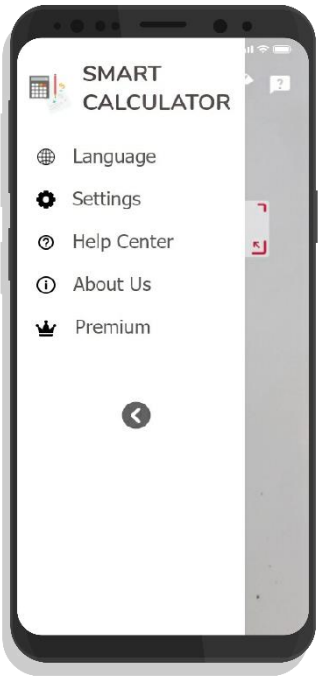


Figure 10: Navigation Screen

Figure 8: Calculator Screen

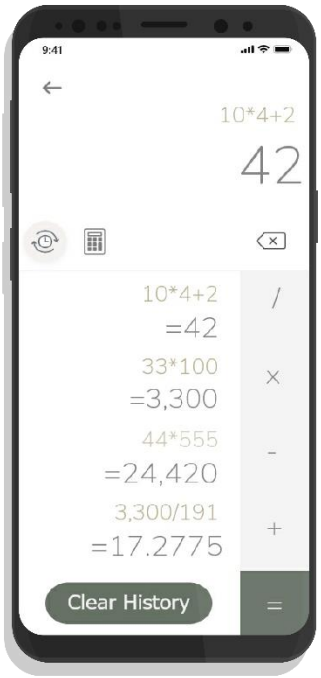


Figure 7: History Screen

2. Test Plan

TEST CASE ID	PRECONDITION	TEST SCENARIO DESCRIPTION		TO TEST THE BASIC CALCULATION FUNCTIONALITY				
		TEST CASE DESCRIPTION	TEST STEPS	TEST DATA	EXPECTED RESULT	POSTCONDITION	ACTUAL RESULT	STATUS
TS01	User should have an android device with the app installed	Doing basic arithmetic calculation	1. Open the app 2. Navigate to calculator screen 3. Input arithmetic expression 4. Click evaluate button	1*2+3	5	Both the input and result should be displayed on the screen		

TEST CASE ID	PRECONDITION	TEST SCENARIO DESCRIPTION		TO TEST THE SCIENTIFIC CALCULATION FUNCTIONALITY				
		TEST CASE DESCRIPTION	TEST STEPS	TEST DATA	EXPECTED RESULT	POSTCONDITION	ACTUAL RESULT	STATUS
TS02	User should have an android device with the app installed	Doing scientific arithmetic calculation	1. Open the app 2. Navigate to calculator screen 3. Input scientific expression 4. Click evaluate button	Sin60+Cos30	-0.15559	Both the input and result should be displayed on the screen		

TEST CASE ID	PRECONDITION	TEST SCENARIO DESCRIPTION		TO TEST THE HISTORY FUNCTIONALITY				
		TEST CASE DESCRIPTION	TEST STEPS	TEST DATA	EXPECTED RESULT	POSTCONDITION	ACTUAL RESULT	STATUS
TS03	User should have performed some calculations	Checking the calculation history	1. Open the app 2. Navigate to calculator screen 3. Click on history icon	-	-	All the previous calculation history should be displayed.		

TEST CASE ID	PRECONDITION	TEST SCENARIO DESCRIPTION		TO TEST THE RECOGNITION OF MATHEMATICAL NOTATION				
		TEST CASE DESCRIPTION	TEST STEPS	TEST DATA	EXPECTED RESULT	POSTCONDITION	ACTUAL RESULT	STATUS
TS04	User should be in the calculator screen	Testing the recognition of scientific notations.	1. Open the app 2. Navigate to calculator screen 3. Input expression with mathematical notation 4. Click evaluate button	5!	120	Both the input and result should be displayed on the screen		

TEST CASE ID	PRECONDITION	TEST SCENARIO DESCRIPTION		TO TEST THE IMAGE CAPTURING FUNCTIONALITY				
		TEST CASE DESCRIPTION	TEST STEPS	TEST DATA	EXPECTED RESULT	POSTCONDITION	ACTUAL RESULT	STATUS
TS05	User should have navigated to camera screen	Capturing image for calculation	1. Open the app 2. Navigate to camera screen 3. Click on capture button 4. Confirm image	-	-	Characters should be extracted		

TEST CASE ID	PRECONDITION	TEST SCENARIO DESCRIPTION		TO TEST THE RECOGNITON OF HANDWRITTEN CHARACTERS				
		TEST CASE DESCRIPTION	TEST STEPS	TEST DATA	EXPECTED RESULT	POSTCONDITION	ACTUAL RESULT	STATUS
TS06	User should have navigated to camera screen	Testing recognition of handwritten characters	1. Open the app 2. Navigate to camera screen 3. Click on capture button 4. Confirm image	-	-	Characters should be extracted		