

# **AI Test Report**

Group 2

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# 1 - AI Function Test Requirement Analysis

## 1.1 AI Function Test Requirements

We have selected a smart computer vision app, Aysa, that utilizes deep machine learning algorithms based on user-provided images.

We have conducted manual testing for Aysa, this deliverable will outline the requirements for this smart computer vision app. Since Aysa is capable of identifying skin diseases from a single image, it helps determine further by prompting questions to the user that help it identify a more specific type of disease, such as further identifying a type of fungal infection.

Though, these images vary, such as in terms of:

- **Low and well-lit images:** Certain images will have darker/low lighting that makes it harder to identify skin diseases, while others will show clear and well-lit images.
- **Multiple lesions in an image:** Images with multiple skin lesions, all over the body.
- **Healthy skin:** Images of healthy skin to test differentiation between actual skin disease and images with purely healthy skin.
- **Maximum and Minimum image resolutions:** Closer up images and zoomed out images, further testing computer vision.
- **Image skin tones:** Images providing all types of skin tones, from darker to lighter skin tones.

The functionality of this smart computer vision is assessed based on the results and interpretations of these images provided for a defined set of test cases, as well as accuracy, and consistency in identifying skin diseases for all inputs.

## 1.2 AI Function Test Requirement Modeling

The testing for this application involves testing on both iOS and Android platforms.

For Aysa the following iOS requirements are as follows:

- Compatible with iOS 14.7 or later.
- Requires 59.3 MB of storage
- Permission to use camera and photo gallery.

For Android requirements:

- Compatible with Android 8.0 and up
- Requires 59.3 MB of storage
- Permission to use camera and photo gallery.

## 2 - AI Test Modeling for Selected AI Features

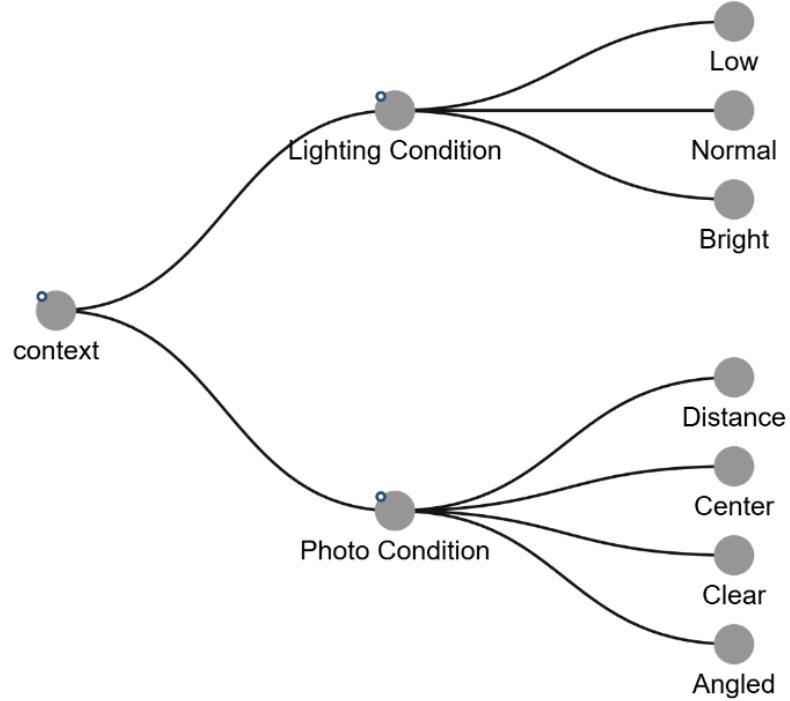
AI Testing Tool used to create decision tables URL: [AI Testing Tool](#)

### 2.1 Context Modeling for Each Selected AI-Powered Function/Feature

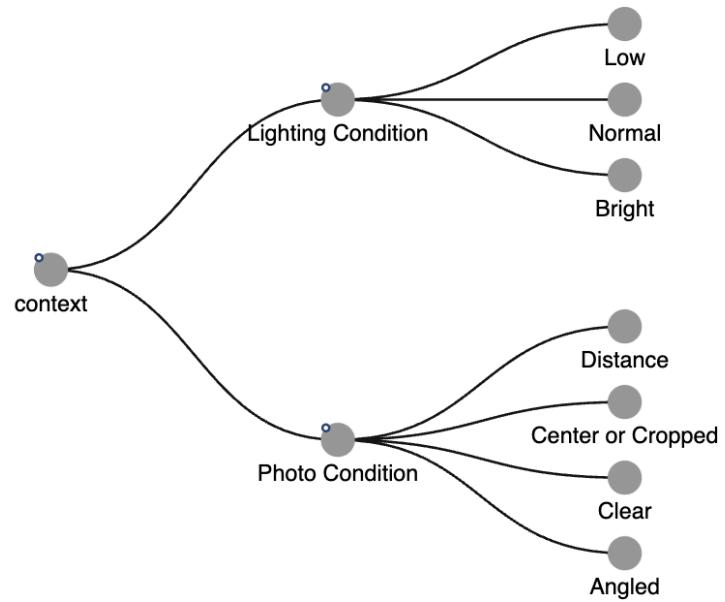
When we consider and discuss the context modeling for skin diseases and identification of such diseases, we consider many external factors surrounding the subjects and imagery. In this case, we are provided with a human being and an image of their skin. We examine the elements of the image such as image background, lighting, resolution, lesions, as well as the subject itself considering age, skin tone, and the specific body part. Such factors can most definitely influence whether the subject is provided a closely accurate and specific diagnosis or if the application will need further information from the subject.

To further evaluate and understand how different contexts affect identification and application evaluation, we have formulated various test scenarios that involve utilization of these images and the subjects. These scenarios might involve altering image lighting, backgrounds, resolution, types of lesions and body parts, along with different subjects. Using Aysa, the smart computer vision app for identifying skin diseases, we will generate a spanning tree to then represent these scenarios and systematically test the skin disease system's robustness and evaluation against the changes in different contexts.

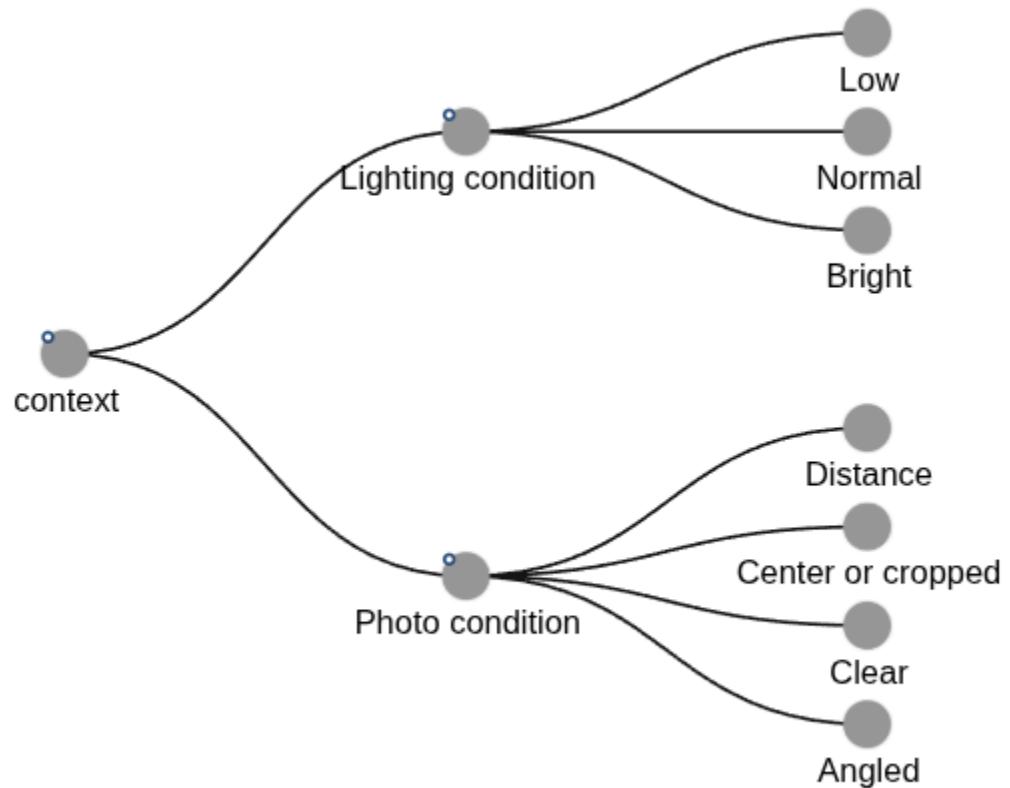
### 2.1.1 Melanoma Context Model



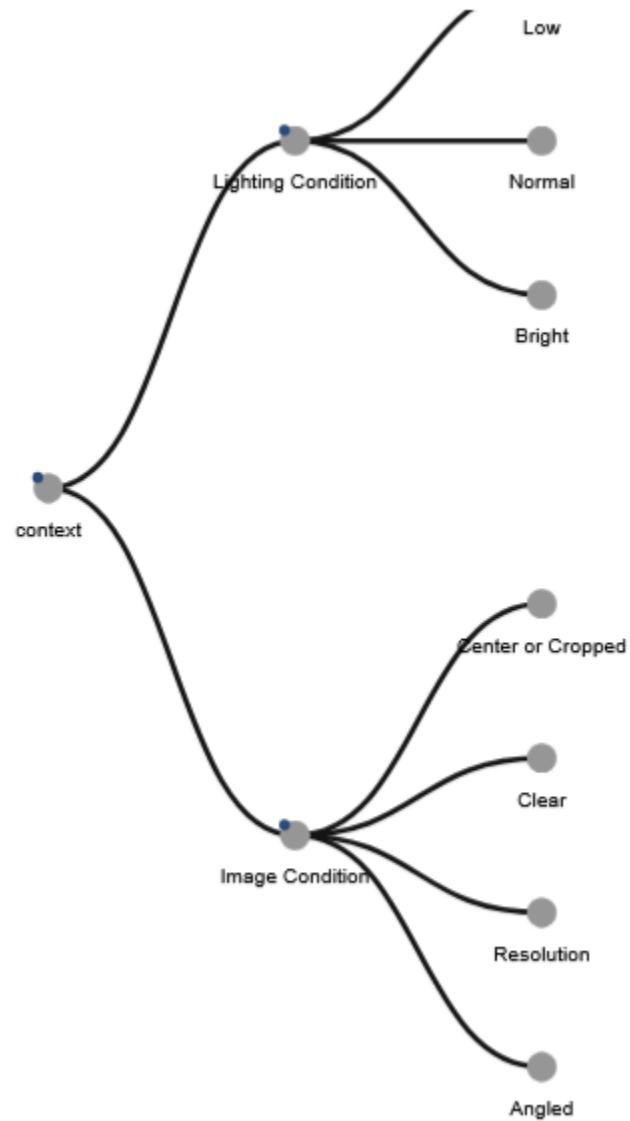
## 2.1.2 Eczema Context Model



### 2.1.3 Psoriasis Context Model

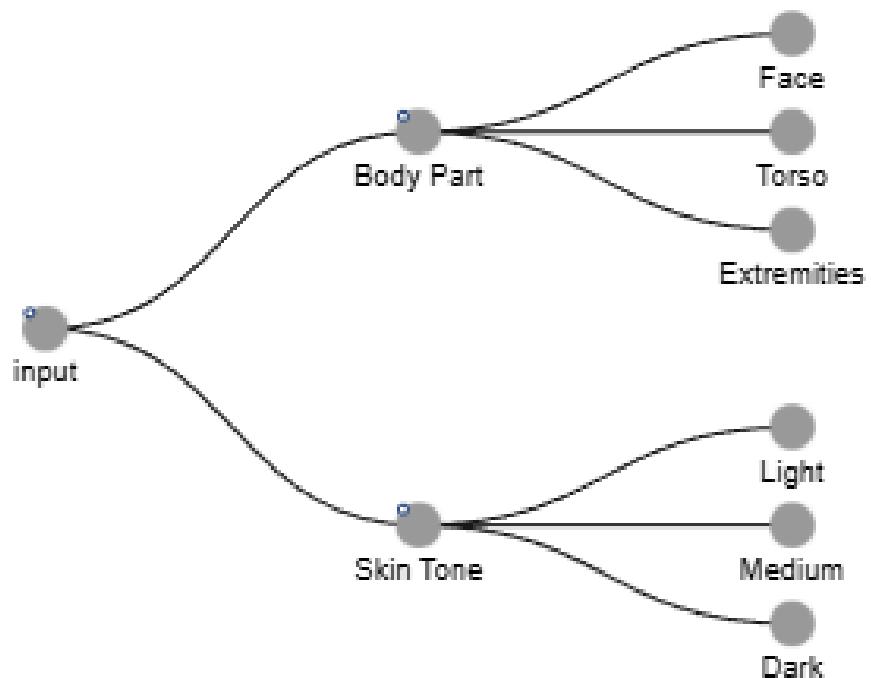


#### 2.1.4 Fungal Infection Context Model

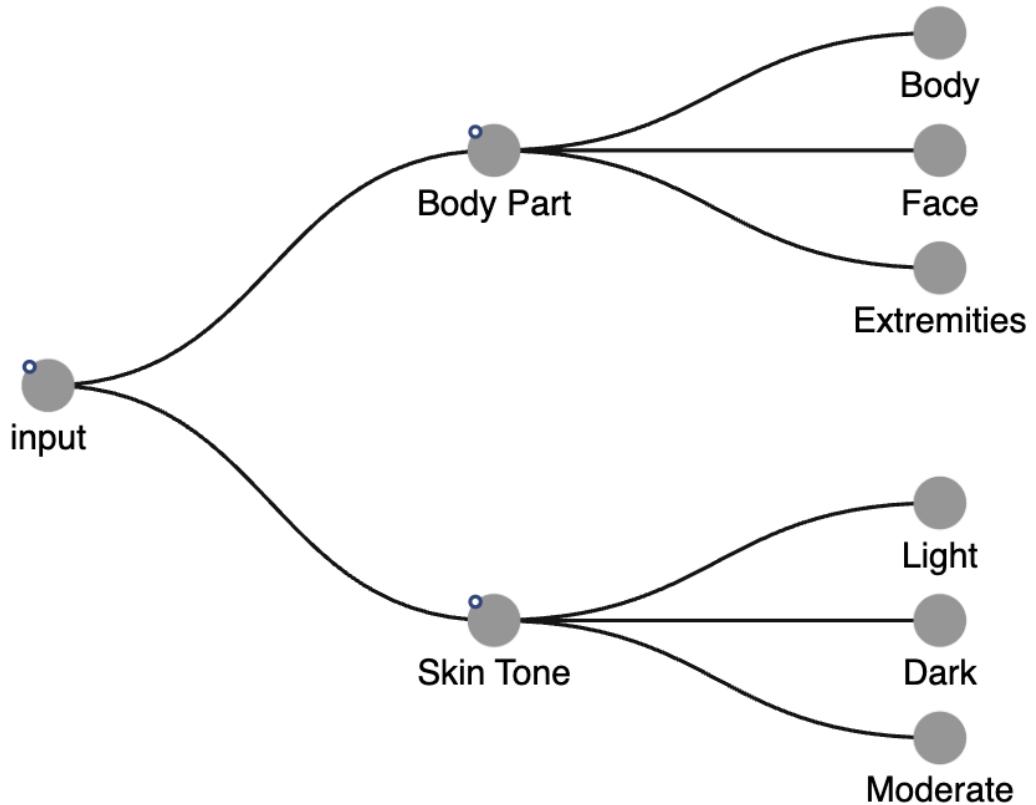


## 2.2 AI-Powered Function Input Classifications

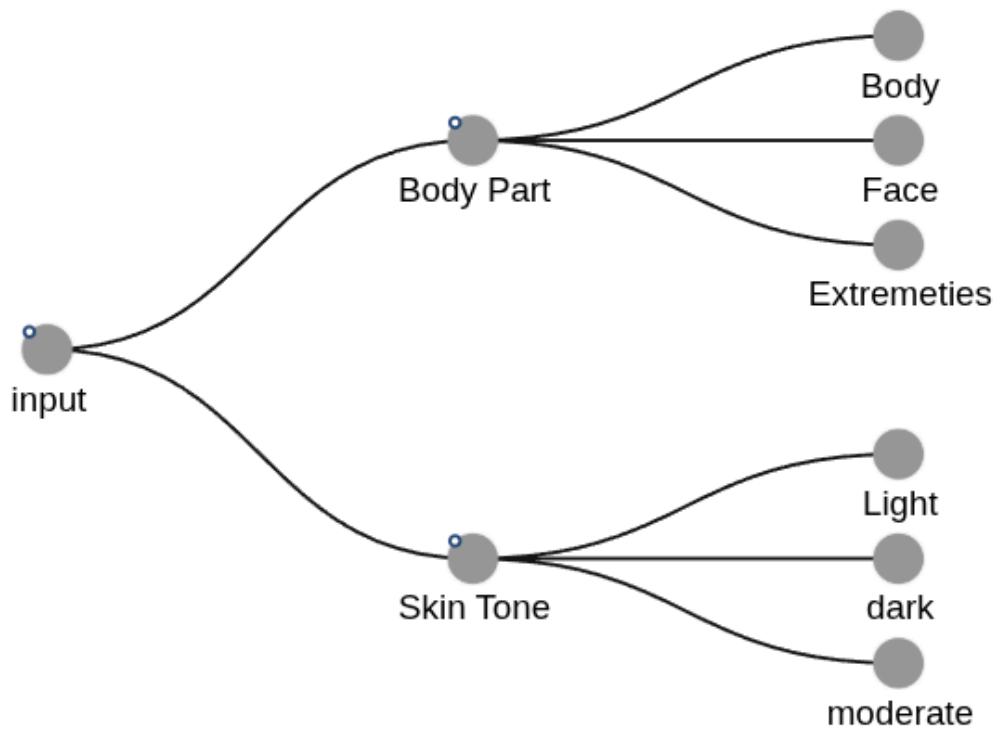
### 2.2.1 Melanoma Input Model



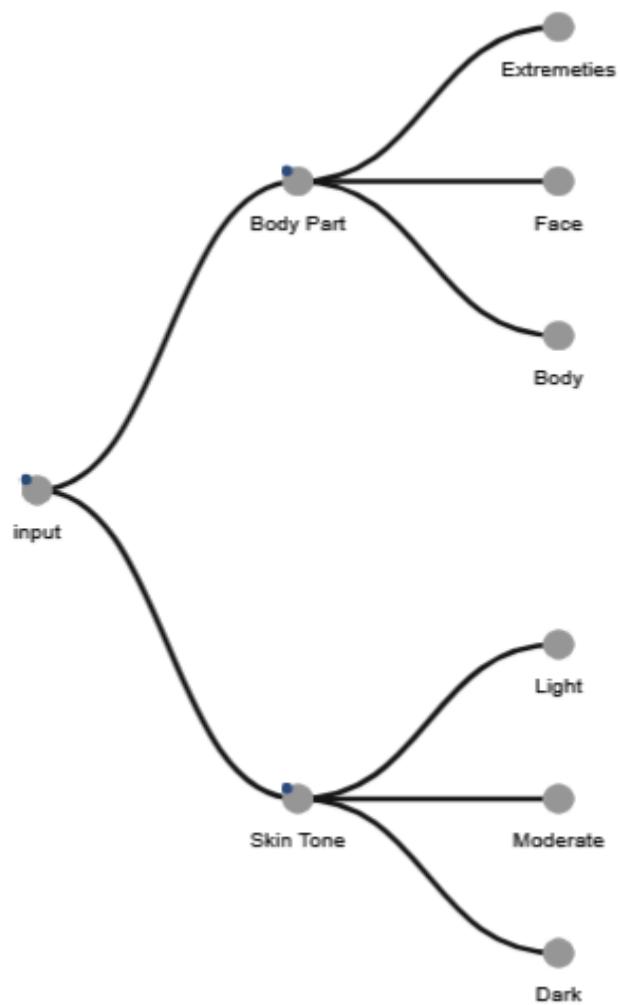
### 2.2.2 Eczema Input Model



### 2.2.3 Psoriasis Input Model

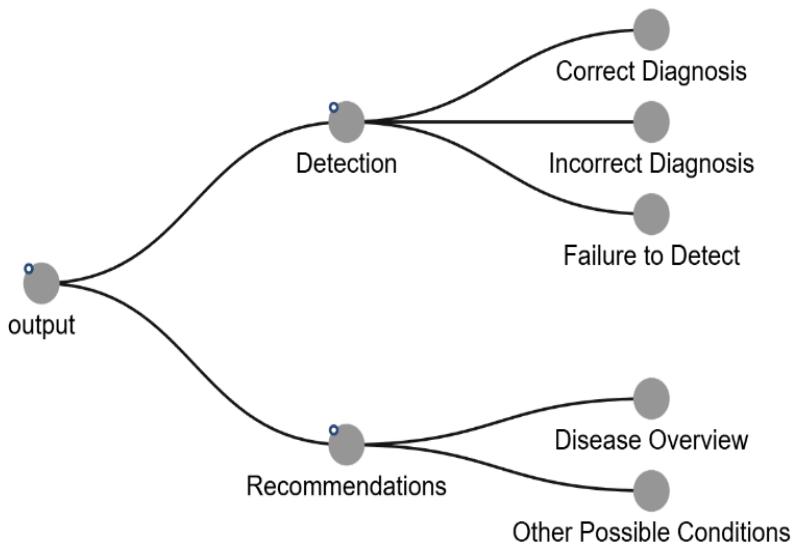


#### 2.2.4 Fungal Infection Input Model

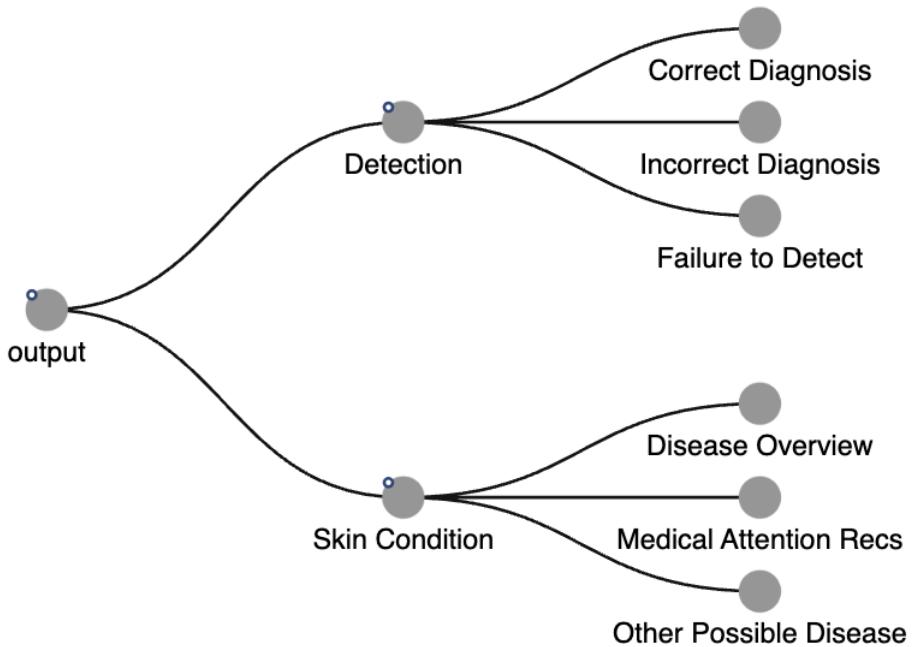


## 2.3 AI-Powered Function Output/Event/Action Classifications

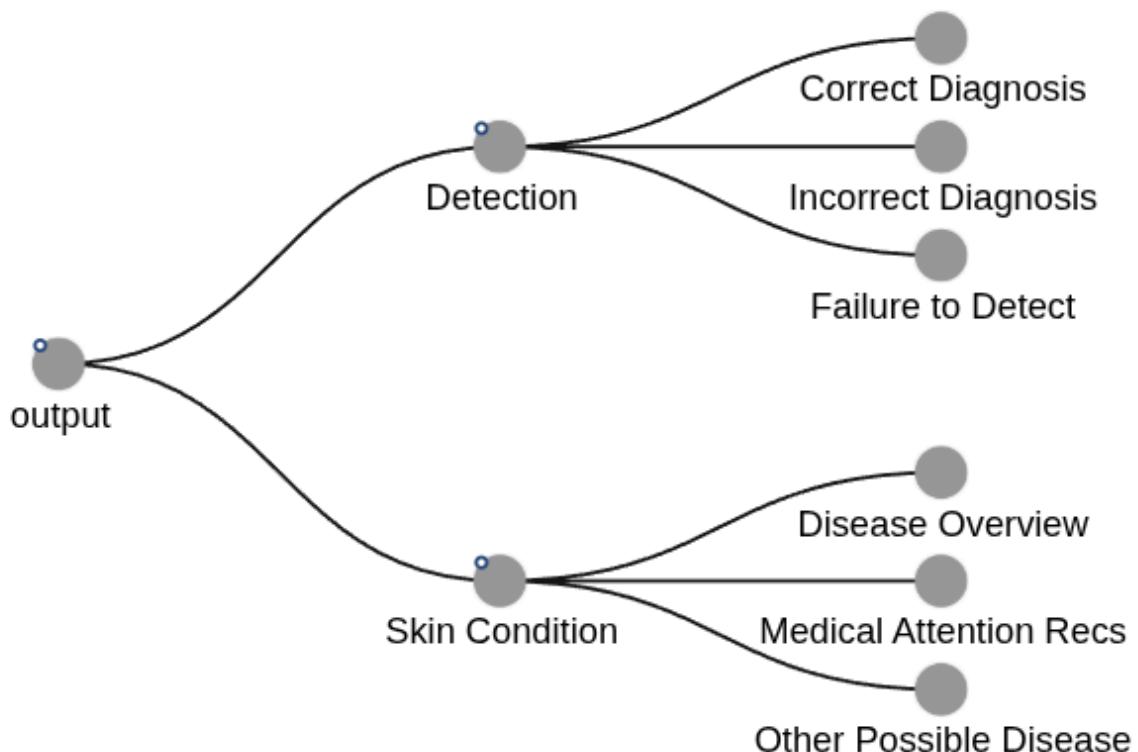
### 2.3.1 Melanoma Output Model



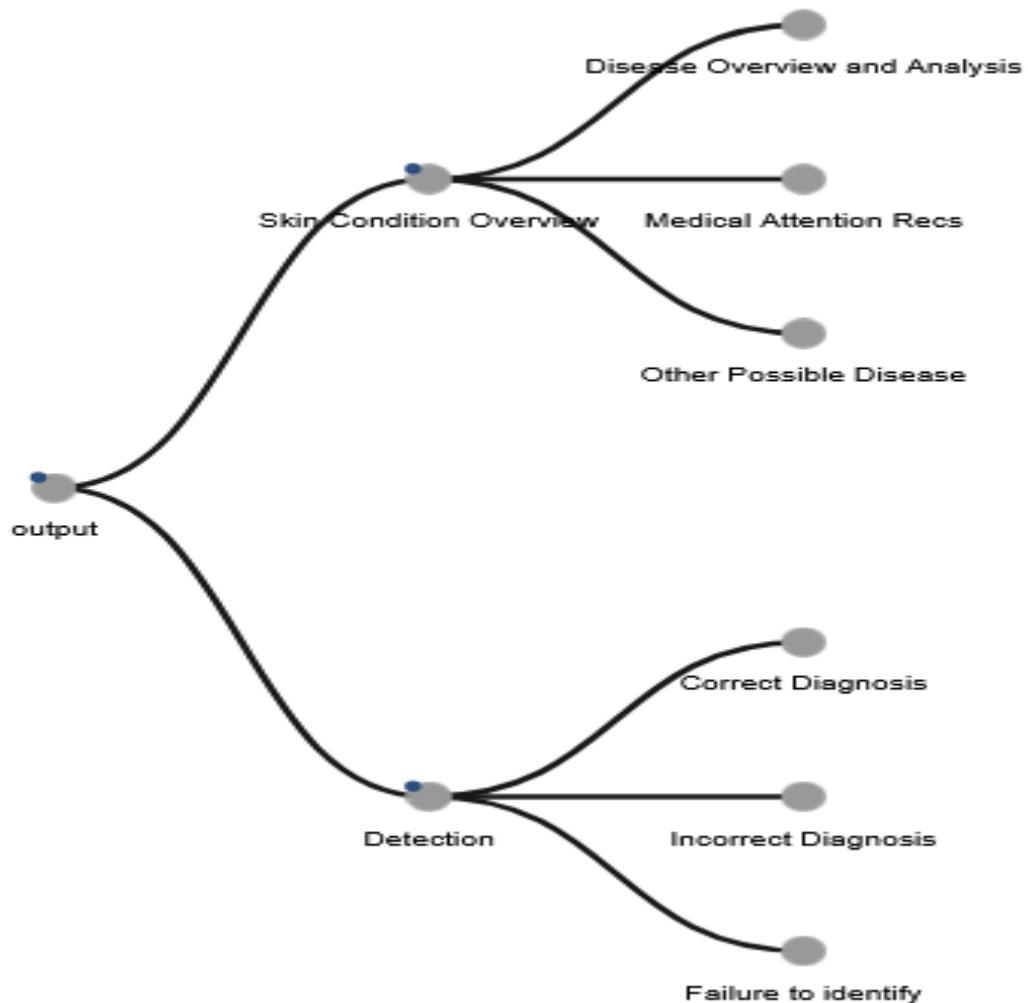
### 2.3.2 Eczema Output Model



### 2.3.3 Psoriasis Output Model



#### 2.3.4 Fungal Infection Output Model



## 2.4 AI-Powered Function Classification Decision Tables

#### 2.4.1 Melanoma Function Classification Decision Table

Id	Image	Lighting Condition	Patient Condition	Recommendations		Body Part	Age Group
				Distance	Angle		
1	1	Low	Cancer	Center	Clear	Face	Young
2	2	Low	Cancer	Center	Angled	Face	Young
3	3	Low	Cancer	Distance	Clear	Face	Young
4	4	Low	Cancer	Distance	Angled	Face	Young
5	5	Normal	Cancer	Center	Clear	Face	Young
6	6	Normal	Cancer	Center	Angled	Face	Young
7	7	Normal	Cancer	Distance	Clear	Face	Young
8	8	Normal	Cancer	Distance	Angled	Face	Young
9	9	Bright	Cancer	Center	Clear	Face	Young
10	10	Bright	Cancer	Center	Angled	Face	Young
11	11	Bright	Cancer	Distance	Clear	Face	Young
12	12	Bright	Cancer	Distance	Angled	Face	Young
13	13	Bright	Normal	Center	Clear	Hand	Middle
14	14	Bright	Normal	Center	Angled	Hand	Middle
15	15	Bright	Normal	Distance	Clear	Hand	Middle
16	16	Bright	Normal	Distance	Angled	Hand	Middle
17	17	Bright	Normal	Center	Clear	Leg	Older
18	18	Bright	Normal	Center	Angled	Leg	Older
19	19	Bright	Normal	Distance	Clear	Leg	Older
20	20	Bright	Normal	Distance	Angled	Leg	Older

#### 2.4.2 Eczema Function Classification Decision Table

id	Detection	Skin Condition	Disease Overview	Other Possible Disease	Disease Overview	Other Possible Disease	Disease Overview	Other Possible Disease	Disease Overview	Photo Condition	Distance	Lighting Condition	Skin Tone		
													Light	Dark	
1	Correct Diagnosis	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Center or Cropped	Distance	Angled	Clear	Moderate	Dark
2	Incorrect Diagnosis	Bright	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Center or Cropped	Distance	Angled	Clear	Light	Light
3	Correct Diagnosis	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Center or Cropped	Distance	Angled	Clear	Moderate	Dark
4	Correct Diagnosis	Bright	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Center or Cropped	Distance	Angled	Clear	Light	Light
5	Correct Diagnosis	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Center or Cropped	Distance	Angled	Clear	Moderate	Dark
6	Incorrect Diagnosis	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Center or Cropped	Distance	Angled	Clear	Light	Light
7	Correct Diagnosis	Bright	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Center or Cropped	Distance	Angled	Clear	Moderate	Dark
8	Correct Diagnosis	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Center or Cropped	Distance	Angled	Clear	Light	Light
9	Incorrect Diagnosis	Bright	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Center or Cropped	Distance	Angled	Clear	Moderate	Dark
10	Correct Diagnosis	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Center or Cropped	Distance	Angled	Clear	Light	Light

### 2.4.3 Psoriasis Function Classification Decision Table

id	Detection	Skin Condition	Body Part	Photo condition			
				Distance	Center or cropped	Clear	Angled
1	Correct Diagnosis	Disease Overview	Body	Low	High	Low	Low
2	Incorrect Diagnosis	Other Possible Disease	Body	Low	High	Low	Low
3	Correct Diagnosis	Disease Overview	Face	Low	High	Low	Low
4	Incorrect Diagnosis	Other Possible Disease	Face	Low	High	Low	Low
5	Correct Diagnosis	Disease Overview	Extremities	Low	High	Low	Low
6	Incorrect Diagnosis	Other Possible Disease	Extremities	Low	High	Low	Low
7	Correct Diagnosis	Disease Overview	Extremities	Low	High	Low	Low
8	Incorrect Diagnosis	Other Possible Disease	Extremities	Low	High	Low	Low
9	Correct Diagnosis	Disease Overview	Extremities	Low	High	Low	Low
10	Bright	Bright	Extremities	Low	High	Low	Low

#### 2.4.4 Fungal Infection Function Classification Decision Table

# 3 - AI Function Test Cases with Inputs/Expected Outputs

## 3.1 AI-Powered Function Test Sets

The following test sets are carefully organized collections of test cases that aim to check and validate functionality of many AI-based features across multiple inputs and scenarios. We have outlined our approach to testing an AI computer vision application for identifying skin diseases and providing an analysis for a user's specific image input.

### **Image-Based Skin Disease Identification**

#### **Purpose:**

The goal of this test set is to ensure and validate the integrity of the AI system, Aysa, and verify that it correctly identifies the skin disease based on the images and subjects provided. We tested various times with a variety of input scenarios, and a variety of subjects, all varying and contributing to identification of disease. We then can assess whether the system makes accurate identifications and analysis and handles any ambiguous or hindering image inputs appropriately.

#### **Test Set Structure:**

- **Standard Cases:** These cases include images and subjects with common symptoms of a well-known disease that is easily identifiable through image recognition. They validate that the computer vision application can correctly identify simple and easily identifiable diseases.
- **Edge Cases:** These test cases and images challenge the application, Aysa. They help determine if Aysa can easily handle identification scenarios where there are multiple lesions or more than one condition. As well as any conditions that are subsets of certain conditions, such as ringworm being a subset of fungal infection.
- **Ambiguous Cases:** Vague or difficult cases, such as images with certain effects. It allows Aysa to prompt for additional information or clarification from the user before making any sort of identification to ensure that their analysis is correct. It ensures that the application does not make premature conclusions based on data that is incomplete or could result in an inaccurate identification and analysis.

## 3.2 Test Data Models

## AI Test Automation Strategy

AI-powered automation executes test flows for many pipelines that once required a lot of manual performance and hands-on testing. However, now with automated test suites at each stage of testing such as unit testing, integration, and system testing, engineers can easily prototype and validate or invalidate new code and trigger new performance benchmarks and goals in mind. This approach of AI test automation enhances and accelerates delivery cycles and improves feedback loops, which introduces a layer of infrastructure and orchestration that requires some or minimal configuration and maintenance.

Certain implementations involve the use of mobile applications, like Aysa in our case, and driving them through the use of emulator instances and testing or simulated scripts that reproduce realistic user interactions and communicate with the test framework and application. Through the simulation of end-user actions such as taps, image imports, swipes, text, etc. through a variety of emulator or script profiles, the test environment can uncover defects or uncommon cases quickly. This is a rigorous and automated validation that not only verifies functional correctness under controlled conditions but provides performance metrics and logs for troubleshooting. AI-augmented automation strategy strikes a balance between the precision and speed of these test cases, thus helping enable confidence in application stability and quality.

### 3.2.1 Melanoma

#### 3.2.1.1 Context Spanning Tree

@id	Lighting Condition	Photo Condition
1	Low	Distance
2	Low	Center
3	Low	Clear
4	Low	Angled
5	Normal	Distance
6	Normal	Center
7	Normal	Clear
8	Normal	Angled
9	Bright	Distance
10	Bright	Center
11	Bright	Clear
12	Bright	Angled

### 3.2.1.2 Input Spanning Tree

@id	Body Part	Skin Tone
1	Face	Light
2	Face	Medium
3	Face	Dark
4	Torso	Light
5	Torso	Medium
6	Torso	Dark
7	Extremities	Light
8	Extremities	Medium
9	Extremities	Dark

### 3.2.1.3 Output Spanning Tree

@id	Detection	Recommendations
1	Correct Diagnosis	Disease Overview
2	Correct Diagnosis	Disease Overview
3	Incorrect Diagnosis	Other Possible Conditions
4	Correct Diagnosis	Disease Overview
5	Correct Diagnosis	Disease Overview
6	Incorrect Diagnosis	Other Possible Conditions
7	Correct Diagnosis	Disease Overview
8	Correct Diagnosis	Disease Overview
9	Incorrect Diagnosis	Other Possible Conditions

### 3.2.1.4 AI Testing Tool Test Cases

Partial list of test cases generated by the AI testing tool for melanoma

		Input Feature		Context Feature		Expected Output	
	id	Body Part	Skin Tone	Lighting Condition	Photo Condition	Detection	Recommendations
□	1	Face	Light	Low	Distance	Correct Diagnosis	Disease Overview
□	2	Face	Medium	Low	Distance	Correct Diagnosis	Disease Overview
□	3	Face	Dark	Low	Distance	Incorrect Diagnosis	Other Possible Conditions
□	4	Torso	Light	Low	Distance	Correct Diagnosis	Disease Overview
□	5	Torso	Medium	Low	Distance	Correct Diagnosis	Disease Overview
□	6	Torso	Dark	Low	Distance	Incorrect Diagnosis	Other Possible Conditions
□	7	Extremities	Light	Low	Distance	Correct Diagnosis	Disease Overview
□	8	Extremities	Medium	Low	Distance	Correct Diagnosis	Disease Overview
□	9	Extremities	Dark	Low	Distance	Incorrect Diagnosis	Other Possible Conditions
□	10	Face	Light	Low	Center	Correct Diagnosis	Disease Overview
□	11	Face	Medium	Low	Center	Correct Diagnosis	Disease Overview
□	12	Face	Dark	Low	Center	Incorrect Diagnosis	Other Possible Conditions
□	13	Torso	Light	Low	Center	Correct Diagnosis	Disease Overview
□	14	Torso	Medium	Low	Center	Correct Diagnosis	Disease Overview
□	15	Torso	Dark	Low	Center	Incorrect Diagnosis	Other Possible Conditions
□	16	Extremities	Light	Low	Center	Correct Diagnosis	Disease Overview
□	17	Extremities	Medium	Low	Center	Correct Diagnosis	Disease Overview
□	18	Extremities	Dark	Low	Center	Incorrect Diagnosis	Other Possible Conditions
□	19	Face	Light	Low	Clear	Correct Diagnosis	Disease Overview
□	20	Face	Medium	Low	Clear	Correct Diagnosis	Disease Overview

		Input Feature		Context Feature		Expected Output	
	id	Body Part	Skin Tone	Lighting Condition	Photo Condition	Detection	Recommendations
	21	Face	Dark	Low	Clear	Incorrect Diagnosis	Other Possible Conditions
	22	Torso	Light	Low	Clear	Correct Diagnosis	Disease Overview
	23	Torso	Medium	Low	Clear	Correct Diagnosis	Disease Overview
	24	Torso	Dark	Low	Clear	Incorrect Diagnosis	Other Possible Conditions
	25	Extremities	Light	Low	Clear	Correct Diagnosis	Disease Overview
	26	Extremities	Medium	Low	Clear	Correct Diagnosis	Disease Overview
	27	Extremities	Dark	Low	Clear	Incorrect Diagnosis	Other Possible Conditions
	28	Face	Light	Low	Angled	Correct Diagnosis	Disease Overview
	29	Face	Medium	Low	Angled	Correct Diagnosis	Disease Overview
	30	Face	Dark	Low	Angled	Incorrect Diagnosis	Other Possible Conditions
	31	Torso	Light	Low	Angled	Correct Diagnosis	Disease Overview
	32	Torso	Medium	Low	Angled	Correct Diagnosis	Disease Overview
	33	Torso	Dark	Low	Angled	Incorrect Diagnosis	Other Possible Conditions
	34	Extremities	Light	Low	Angled	Correct Diagnosis	Disease Overview
	35	Extremities	Medium	Low	Angled	Correct Diagnosis	Disease Overview
	36	Extremities	Dark	Low	Angled	Incorrect Diagnosis	Other Possible Conditions
	37	Face	Light	Normal	Distance	Correct Diagnosis	Disease Overview
	38	Face	Medium	Normal	Distance	Correct Diagnosis	Disease Overview
	39	Face	Dark	Normal	Distance	Incorrect Diagnosis	Other Possible Conditions
	40	Torso	Light	Normal	Distance	Correct Diagnosis	Disease Overview

## 3.2.2 Eczema

### 3.2.2.1 Context Spanning Tree

@id	Lighting Condition	Photo Condition
1	Low	Distance
2	Low	Center or Cropped
3	Low	Clear
4	Low	Angled
5	Normal	Distance
6	Normal	Center or Cropped
7	Normal	Clear
8	Normal	Angled
9	Bright	Distance
10	Bright	Center or Cropped
11	Bright	Clear
12	Bright	Angled

### 3.2.2.2 Input Spanning Tree

@id	Body Part	Skin Tone
1	Body	Light
2	Body	Dark
3	Body	Moderate
4	Face	Light
5	Face	Dark
6	Face	Moderate
7	Extremeties	Light
8	Extremeties	Dark
9	Extremeties	Moderate

### 3.2.2.3 Output Spanning Tree

@id	Detection	Skin Condition
1	Correct Diagnosis	Disease Overview
2	Incorrect Diagnosis	Other Possible Disease
3	Correct Diagnosis	Disease Overview
4	Correct Diagnosis	Disease Overview
5	Incorrect Diagnosis	Other Possible Disease
6	Correct Diagnosis	Disease Overview
7	Correct Diagnosis	Disease Overview
8	Incorrect Diagnosis	Other Possible Disease
9	Correct Diagnosis	Disease Overview

### 3.2.2.4 AI Testing Tool Test Cases

Partial list of test case designs generated by AI testing tool:

	Input Feature		Context Feature			Expected Output		
	<input type="checkbox"/>	id	Body Part	Skin Tone	Lighting Condition	Photo Condition	Detection	Skin Condition
1	<input type="checkbox"/>	1	Body	Light	Low	Distance	Correct Diagnosis	Disease Overview
2	<input type="checkbox"/>	2	Body	Dark	Low	Distance	Incorrect Diagnosis	Other Possible Disease
3	<input type="checkbox"/>	3	Body	Moderate	Low	Distance	Correct Diagnosis	Disease Overview
4	<input type="checkbox"/>	4	Face	Light	Low	Distance	Correct Diagnosis	Disease Overview
5	<input type="checkbox"/>	5	Face	Dark	Low	Distance	Incorrect Diagnosis	Other Possible Disease
6	<input type="checkbox"/>	6	Face	Moderate	Low	Distance	Correct Diagnosis	Disease Overview
7	<input type="checkbox"/>	7	Extremeties	Light	Low	Distance	Correct Diagnosis	Disease Overview
8	<input type="checkbox"/>	8	Extremeties	Dark	Low	Distance	Incorrect Diagnosis	Other Possible Disease
9	<input type="checkbox"/>	9	Extremeties	Moderate	Low	Distance	Correct Diagnosis	Disease Overview
10	<input type="checkbox"/>	10	Body	Light	Low	Center or Cropped	Correct Diagnosis	Disease Overview
11	<input type="checkbox"/>	11	Body	Dark	Low	Center or Cropped	Incorrect Diagnosis	Other Possible Disease
12	<input type="checkbox"/>	12	Body	Moderate	Low	Center or Cropped	Correct Diagnosis	Disease Overview
13	<input type="checkbox"/>	13	Face	Light	Low	Center or Cropped	Correct Diagnosis	Disease Overview
14	<input type="checkbox"/>	14	Face	Dark	Low	Center or Cropped	Incorrect Diagnosis	Other Possible Disease
15	<input type="checkbox"/>	15	Face	Moderate	Low	Center or Cropped	Correct Diagnosis	Disease Overview
16	<input type="checkbox"/>	16	Extremeties	Light	Low	Center or Cropped	Correct Diagnosis	Disease Overview
17	<input type="checkbox"/>	17	Extremeties	Dark	Low	Center or Cropped	Incorrect Diagnosis	Other Possible Disease
18	<input type="checkbox"/>	18	Extremeties	Moderate	Low	Center or Cropped	Correct Diagnosis	Disease Overview
19	<input type="checkbox"/>	19	Body	Light	Low	Clear	Correct Diagnosis	Disease Overview
20	<input type="checkbox"/>	20	Body	Dark	Low	Clear	Incorrect Diagnosis	Other Possible Disease

	<b>id</b>	<b>Body Part</b>	<b>Skin Tone</b>	<b>Lighting Condition</b>	<b>Photo Condition</b>	<b>Detection</b>	<b>Skin Condition</b>
□	21	Body	Moderate	Low	Clear	Correct Diagnosis	Disease Overview
□	22	Face	Light	Low	Clear	Correct Diagnosis	Disease Overview
□	23	Face	Dark	Low	Clear	Incorrect Diagnosis	Other Possible Disease
□	24	Face	Moderate	Low	Clear	Correct Diagnosis	Disease Overview
□	25	Extremities	Light	Low	Clear	Correct Diagnosis	Disease Overview
□	26	Extremities	Dark	Low	Clear	Incorrect Diagnosis	Other Possible Disease
□	27	Extremities	Moderate	Low	Clear	Correct Diagnosis	Disease Overview
□	28	Body	Light	Low	Angled	Correct Diagnosis	Disease Overview
□	29	Body	Dark	Low	Angled	Incorrect Diagnosis	Other Possible Disease
□	30	Body	Moderate	Low	Angled	Correct Diagnosis	Disease Overview
□	31	Face	Light	Low	Angled	Correct Diagnosis	Disease Overview
□	32	Face	Dark	Low	Angled	Incorrect Diagnosis	Other Possible Disease
□	33	Face	Moderate	Low	Angled	Correct Diagnosis	Disease Overview
□	34	Extremities	Light	Low	Angled	Correct Diagnosis	Disease Overview
□	35	Extremities	Dark	Low	Angled	Incorrect Diagnosis	Other Possible Disease
□	36	Extremities	Moderate	Low	Angled	Correct Diagnosis	Disease Overview
□	37	Body	Light	Normal	Distance	Correct Diagnosis	Disease Overview
□	38	Body	Dark	Normal	Distance	Incorrect Diagnosis	Other Possible Disease
□	39	Body	Moderate	Normal	Distance	Correct Diagnosis	Disease Overview
□	40	Face	Light	Normal	Distance	Correct Diagnosis	Disease Overview

### 3.2.3 Psoriasis

#### 3.2.3.1 Context Spanning Tree

<b>id</b>	<b>Lighting condition</b>	<b>Photo condition</b>
1	Low	Distance
2	Low	Center or cropped
3	Low	Clear
4	Low	Angled
5	Normal	Distance
6	Normal	Center or cropped
7	Normal	Clear
8	Normal	Angled
9	Bright	Distance
10	Bright	Center or cropped
11	Bright	Clear
12	Bright	Angled

#### 3.2.3.2 Input Spanning Tree

<b>id</b>	<b>Body Part</b>	<b>Skin Tone</b>	<b>Edit Output</b>
1	Body	Light	<button>Edit Output</button>
2	Body	dark	<button>Edit Output</button>
3	Body	moderate	<button>Edit Output</button>
4	Face	Light	<button>Edit Output</button>
5	Face	dark	<button>Edit Output</button>
6	Face	moderate	<button>Edit Output</button>
7	Extremeties	Light	<button>Edit Output</button>
8	Extremeties	dark	<button>Edit Output</button>
9	Extremeties	moderate	<button>Edit Output</button>

### 3.2.3.3 Output Spanning Tree

<b>id</b>	<b>Detection</b>	<b>Skin Condition</b>
1	undefined	undefined
2	undefined	undefined
3	undefined	undefined
4	undefined	undefined
5	undefined	undefined
6	undefined	undefined
7	undefined	undefined
8	undefined	undefined
9	undefined	undefined

### 3.2.3.4 AI Testing Tool Test Cases

	Input Feature		Context Feature			Expected Output		Image Input	Upload
	<b>Id</b>	<b>Body Part</b>	<b>Skin Tone</b>	<b>Lighting condition</b>	<b>Photo condition</b>	<b>Detection</b>	<b>Skin Condition</b>		
□	1	Body	Light	Low	Distance	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	<input type="button" value="Upload"/>
□	2	Body	dark	Low	Distance	Incorrect Diagnosis	Other Possible Disease	<input type="button" value="Upload"/>	<input type="button" value="Upload"/>
□	3	Body	moderate	Low	Distance	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	<input type="button" value="Upload"/>
□	4	Face	Light	Low	Distance	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	<input type="button" value="Upload"/>
□	5	Face	dark	Low	Distance	Incorrect Diagnosis	Other Possible Disease	<input type="button" value="Upload"/>	<input type="button" value="Upload"/>
□	6	Face	moderate	Low	Distance	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	<input type="button" value="Upload"/>
□	7	Extremities	Light	Low	Distance	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	<input type="button" value="Upload"/>
□	8	Extremities	dark	Low	Distance	Incorrect Diagnosis	Other Possible Disease	<input type="button" value="Upload"/>	<input type="button" value="Upload"/>
□	9	Extremities	moderate	Low	Distance	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	<input type="button" value="Upload"/>
□	10	Body	Light	Low	Center or cropped	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	<input type="button" value="Upload"/>
□	11	Body	dark	Low	Center or cropped	Incorrect Diagnosis	Other Possible Disease	<input type="button" value="Upload"/>	<input type="button" value="Upload"/>
□	12	Body	moderate	Low	Center or cropped	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	<input type="button" value="Upload"/>
□	13	Face	Light	Low	Center or cropped	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	<input type="button" value="Upload"/>
□	14	Face	dark	Low	Center or cropped	Incorrect Diagnosis	Other Possible Disease	<input type="button" value="Upload"/>	<input type="button" value="Upload"/>
□	15	Face	moderate	Low	Center or cropped	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	<input type="button" value="Upload"/>
□	16	Extremities	Light	Low	Center or cropped	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	<input type="button" value="Upload"/>
□	17	Extremities	dark	Low	Center or cropped	Incorrect Diagnosis	Other Possible Disease	<input type="button" value="Upload"/>	<input type="button" value="Upload"/>
□	18	Extremities	moderate	Low	Center or cropped	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	<input type="button" value="Upload"/>
□	19	Body	Light	Low	Clear	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	<input type="button" value="Upload"/>
□	20	Body	dark	Low	Clear	Incorrect Diagnosis	Other Possible Disease	<input type="button" value="Upload"/>	<input type="button" value="Upload"/>

		Input Feature		Context Feature		Expected Output		Image Input	Upload
		Body Part	Skin Tone	Lighting condition	Photo condition	Detection	Skin Condition		
	21	Body	moderate	Low	Clear	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	
	22	Face	Light	Low	Clear	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	
	23	Face	dark	Low	Clear	Incorrect Diagnosis	Other Possible Disease	<input type="button" value="Upload"/>	
	24	Face	moderate	Low	Clear	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	
	25	Extremities	Light	Low	Clear	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	
	26	Extremities	dark	Low	Clear	Incorrect Diagnosis	Other Possible Disease	<input type="button" value="Upload"/>	
	27	Extremities	moderate	Low	Clear	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	
	28	Body	Light	Low	Angled	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	
	29	Body	dark	Low	Angled	Incorrect Diagnosis	Other Possible Disease	<input type="button" value="Upload"/>	
	30	Body	moderate	Low	Angled	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	
	31	Face	Light	Low	Angled	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	
	32	Face	dark	Low	Angled	Incorrect Diagnosis	Other Possible Disease	<input type="button" value="Upload"/>	
	33	Face	moderate	Low	Angled	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	
	34	Extremities	Light	Low	Angled	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	
	35	Extremities	dark	Low	Angled	Incorrect Diagnosis	Other Possible Disease	<input type="button" value="Upload"/>	
	36	Extremities	moderate	Low	Angled	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	
	37	Body	Light	Normal	Distance	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	
	38	Body	dark	Normal	Distance	Incorrect Diagnosis	Other Possible Disease	<input type="button" value="Upload"/>	
	39	Body	moderate	Normal	Distance	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	
	40	Face	Light	Normal	Distance	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	

### 3.2.4 Fungal Infection

#### 3.2.4.1 Context Spanning Tree

id	Image Condition	Lighting Condition
1	Center or Cropped	Low
2	Clear	Low
3	Resolution	Low
4	Angled	Low
5	Center or Cropped	Normal

id	Image Condition	Lighting Condition
6	Clear	Normal
7	Resolution	Normal
8	Angled	Normal
9	Center or Cropped	Bright
10	Clear	Bright

<b>id</b>	<b>Image Condition</b>	<b>Lighting Condition</b>
11	Resolution	Bright
12	Angled	Bright

### 3.2.4.2 Input Spanning Tree

<b>id</b>	<b>Body Part</b>	<b>Skin Tone</b>	<b>Edit Output</b>
1	Extremities	Light	<button>Edit Output</button>
2	Extremities	Moderate	<button>Edit Output</button>
3	Extremities	Dark	<button>Edit Output</button>
4	Face	Light	<button>Edit Output</button>
5	Face	Moderate	<button>Edit Output</button>

<b>id</b>	<b>Body Part</b>	<b>Skin Tone</b>	<b>Edit Output</b>
6	Face	Dark	<button>Edit Output</button>
7	Body	Light	<button>Edit Output</button>
8	Body	Moderate	<button>Edit Output</button>
9	Body	Dark	<button>Edit Output</button>

### 3.2.4.3 Output Spanning Tree

<b>@id</b>	<b>Detection</b>	<b>Recommendations</b>
1	Correct Diagnosis	Disease Overview
2	Correct Diagnosis	Disease Overview
3	Incorrect Diagnosis	Other Possible Conditions
4	Correct Diagnosis	Disease Overview
5	Correct Diagnosis	Disease Overview
6	Incorrect Diagnosis	Other Possible Conditions
7	Correct Diagnosis	Disease Overview
8	Correct Diagnosis	Disease Overview
9	Incorrect Diagnosis	Other Possible Conditions

### 3.2.4.4 AI Testing Tool Test Cases

Partial list of test case designs generated by AI testing tool:

	Input Feature		Context Feature		Expected Output		Image Input	Upload
	ID	Body Part	Skin Tone	Lighting condition	Photo condition	Detection	Skin Condition	
1	1	Body	Light	Low	Distance	Correct Diagnosis	Disease Overview	<button>Upload</button>
2	2	Body	dark	Low	Distance	Incorrect Diagnosis	Other Possible Disease	<button>Upload</button>
3	3	Body	moderate	Low	Distance	Correct Diagnosis	Disease Overview	<button>Upload</button>
4	4	Face	Light	Low	Distance	Correct Diagnosis	Disease Overview	<button>Upload</button>
5	5	Face	dark	Low	Distance	Incorrect Diagnosis	Other Possible Disease	<button>Upload</button>
6	6	Face	moderate	Low	Distance	Correct Diagnosis	Disease Overview	<button>Upload</button>
7	7	Extremities	Light	Low	Distance	Correct Diagnosis	Disease Overview	<button>Upload</button>
8	8	Extremities	dark	Low	Distance	Incorrect Diagnosis	Other Possible Disease	<button>Upload</button>
9	9	Extremities	moderate	Low	Distance	Correct Diagnosis	Disease Overview	<button>Upload</button>
10	10	Body	Light	Low	Center or cropped	Correct Diagnosis	Disease Overview	<button>Upload</button>
11	11	Body	dark	Low	Center or cropped	Incorrect Diagnosis	Other Possible Disease	<button>Upload</button>
12	12	Body	moderate	Low	Center or cropped	Correct Diagnosis	Disease Overview	<button>Upload</button>
13	13	Face	Light	Low	Center or cropped	Correct Diagnosis	Disease Overview	<button>Upload</button>
14	14	Face	dark	Low	Center or cropped	Incorrect Diagnosis	Other Possible Disease	<button>Upload</button>
15	15	Face	moderate	Low	Center or cropped	Correct Diagnosis	Disease Overview	<button>Upload</button>
16	16	Extremities	Light	Low	Center or cropped	Correct Diagnosis	Disease Overview	<button>Upload</button>
17	17	Extremities	dark	Low	Center or cropped	Incorrect Diagnosis	Other Possible Disease	<button>Upload</button>
18	18	Extremities	moderate	Low	Center or cropped	Correct Diagnosis	Disease Overview	<button>Upload</button>
19	19	Body	Light	Low	Clear	Correct Diagnosis	Disease Overview	<button>Upload</button>
20	20	Body	dark	Low	Clear	Incorrect Diagnosis	Other Possible Disease	<button>Upload</button>

		Input Feature		Context Feature		Expected Output		Image Input	Upload
	Id	Body Part	Skin Tone	Lighting condition	Photo condition	Detection	Skin Condition		
<input type="checkbox"/>	21	Body	moderate	Low	Clear	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	
<input type="checkbox"/>	22	Face	Light	Low	Clear	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	
<input type="checkbox"/>	23	Face	dark	Low	Clear	Incorrect Diagnosis	Other Possible Disease	<input type="button" value="Upload"/>	
<input type="checkbox"/>	24	Face	moderate	Low	Clear	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	
<input type="checkbox"/>	25	Extremities	Light	Low	Clear	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	
<input type="checkbox"/>	26	Extremities	dark	Low	Clear	Incorrect Diagnosis	Other Possible Disease	<input type="button" value="Upload"/>	
<input type="checkbox"/>	27	Extremities	moderate	Low	Clear	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	
<input type="checkbox"/>	28	Body	Light	Low	Angled	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	
<input type="checkbox"/>	29	Body	dark	Low	Angled	Incorrect Diagnosis	Other Possible Disease	<input type="button" value="Upload"/>	
<input type="checkbox"/>	30	Body	moderate	Low	Angled	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	
<input type="checkbox"/>	31	Face	Light	Low	Angled	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	
<input type="checkbox"/>	32	Face	dark	Low	Angled	Incorrect Diagnosis	Other Possible Disease	<input type="button" value="Upload"/>	
<input type="checkbox"/>	33	Face	moderate	Low	Angled	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	
<input type="checkbox"/>	34	Extremities	Light	Low	Angled	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	
<input type="checkbox"/>	35	Extremities	dark	Low	Angled	Incorrect Diagnosis	Other Possible Disease	<input type="button" value="Upload"/>	
<input type="checkbox"/>	36	Extremities	moderate	Low	Angled	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	
<input type="checkbox"/>	37	Body	Light	Normal	Distance	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	
<input type="checkbox"/>	38	Body	dark	Normal	Distance	Incorrect Diagnosis	Other Possible Disease	<input type="button" value="Upload"/>	
<input type="checkbox"/>	39	Body	moderate	Normal	Distance	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	
<input type="checkbox"/>	40	Face	Light	Normal	Distance	Correct Diagnosis	Disease Overview	<input type="button" value="Upload"/>	

### 3.3 Test Case Reports

#### 3.3.1 Melanoma

Test Case ID	01
Test Case Input	
Test Description	Light skin tone, low lighting
Expected Output	Melanoma
Actual Output	Melanoma
Result	Pass

Test Case ID	02
Test Case Input	
Test Description	Light skin tone, normal lighting
Expected Output	Melanoma
Actual Output	Melanoma
Result	Pass

Test Case ID	03
Test Case Input	
Test Description	Light skin tone, bright lighting
Expected Output	Melanoma
Actual Output	Melanoma
Result	Pass

Test Case ID	04
Test Case Input	
Test Description	Medium skin tone, low lighting
Expected Output	Melanoma
Actual Output	Solar Keratosis
Result	Fail

Test Case ID	05
Test Case Input	
Test Description	Medium skin tone, normal lighting
Expected Output	Melanoma
Actual Output	Solar Keratosis
Result	Pass

Test Case ID	06
Test Case Input	 A close-up photograph of a skin lesion on light-colored skin. The lesion is dark brown and irregularly shaped, with some lighter pigmentation around its perimeter.
Test Description	Medium skin tone, bright lighting
Expected Output	Melanoma
Actual Output	Melanoma
Result	Pass

Test Case ID	07
Test Case Input	 A close-up photograph of a skin lesion on dark skin. The lesion is dark brown and has a more uniform, circular or oval shape compared to Test Case 06.

Test Description	Dark skin tone, low lighting
Expected Output	Melanoma
Actual Output	Unable to Detect
Result	Fail

Test Case ID	08
Test Case Input	
Test Description	Dark skin tone, normal lighting
Expected Output	Melanoma
Actual Output	Bowen Disease
Result	Fail

Test Case ID	09
Test Case Input	
Test Description	Dark skin tone, Bright lighting
Expected Output	Melanoma
Actual Output	Keloid
Result	Fail

Test Case ID	10
Test Case Input	

Test Description	bright lighting, far in distance
Expected Output	Melanoma
Actual Output	Melanoma
Result	Pass

Test Case ID	11
Test Case Input	
Test Description	normal lighting, far in distance
Expected Output	Melanoma
Actual Output	Melanoma
Result	Pass

Test Case ID	12
Test Case Input	
Test Description	Medium skin tone, low lighting, far in distance
Expected Output	Melanoma
Actual Output	Melanoma
Result	Pass

### 3.3.2 Eczema

Test Case ID	1
Test Description	Normal lighting, moderate skin tone

Test Case Input	
Expected Output	Eczema
Actual Output	Eczema
Result	Pass

Test Case ID	2
Test Description	Low lighting, extremities
Test Case Input	
Expected Output	Eczema
Actual Output	Quality Error
Result	Fail

Test Case ID	3
Test Description	Cropped, moderate skin tone
Test Case Input	 <small>©Dermnet.com</small>
Expected Output	Eczema
Actual Output	Eczema
Result	Pass

Test Case ID	4
Test Description	Distance, moderate skin tone

Test Case Input	
Expected Output	Eczema
Actual Output	Eczema
Result	Pass
Test Case ID	5
Test Description	Cropped, light skin tone



Test Case Input	
Expected Output	Eczema
Actual Output	Eczema
Result	Pass

Test Case ID	6
Test Description	Normal lighting, body
Test Case Input	
Expected Output	Eczema

Actual Output	Eczema
Result	Pass

Test Case ID	7
Test Description	Angled, dark skin tone
Test Case Input	 <small>©Dermnet.com</small>
Expected Output	Eczema
Actual Output	Lichen Simplex Chronicus
Result	Fail

Test Case ID	8
Test Description	Bright, light skin tone

Test Case Input	 A photograph of a person's hand, palm facing forward, showing significant dryness and scaling on the skin, characteristic of eczema.
Expected Output	Eczema
Actual Output	Eczema
Result	Pass

Test Case ID	9
Test Description	Clear, extremities
Test Case Input	 A photograph of a person's forearm, showing clear skin with no visible signs of eczema or other skin conditions.

Expected Output	Eczema
Actual Output	Eczema
Result	Pass

Test Case ID	10
Test Description	Low lighting, dark skin tone
Test Case Input	 <p>A clinical photograph showing a dark-skinned individual's skin. There is a distinct area of red, scaly, and slightly crusted skin, characteristic of eczema. The image is taken in low lighting conditions.</p>
Expected Output	Eczema
Actual Output	Allergic Contact Dermatitis (Eczema)
Result	Pass

Test Case ID	11
Test Description	Bright, light skin tone
Test Case Input	
Expected Output	Eczema
Actual Output	Atopic Eczema
Result	Pass

Test Case ID	12
Test Description	Cropped, extremities

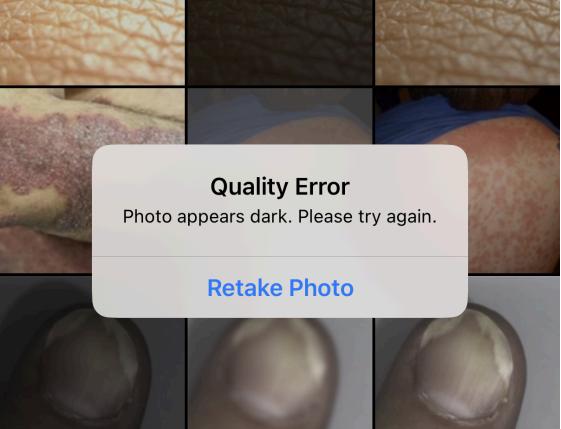
Test Case Input	
Expected Output	Eczema
Actual Output	Eczema
Result	Pass

### 3.3.3 Psoriasis

Test Case Input	Test Case Results

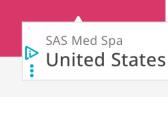
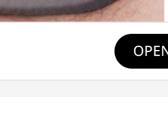
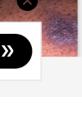
		<p><b>Possible Conditions</b></p> <p>Aysa has identified the following matches. Tap each one to see more images for more information.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Melanoma</p> <p>A melanoma is a type of skin cancer that can be life-threatening and has a risk of spreading to other areas of the body. If caught early, this cancer can be cured.</p> <p><a href="#">More Images and information &gt;</a></p> </div> <div style="text-align: center;">  <p>Atypical nevus</p> <p>Atypical moles (also known as dysplastic moles or atypical nevi) are non-cancerous moles that have a higher risk than common moles of becoming melanoma. Atypical moles resemble melanoma in that they ... <a href="#">More</a></p> <p><a href="#">More Images and information &gt;</a></p> </div> <div style="text-align: center;">  <p>... More</p> </div> </div>	
Test Case ID:	TC-21		
Expected Results:	Nothing		
Actual Results:	Image to dark		
Execution Date	October 11, 2025	Description: Clear skin	
Performed By:	Gurshan Warya	Pass or Fail:	Fail

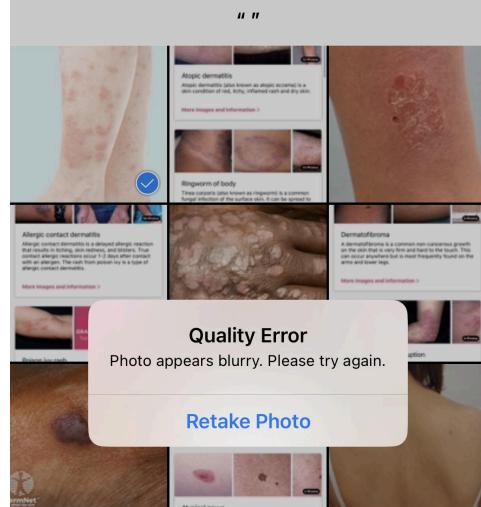
Test Case Input	Test Case Results	
	<p data-bbox="804 340 1351 361"><a href="#">◀ Back</a> <a href="#">Done</a></p> <h3 data-bbox="943 375 1209 403">Possible Conditions</h3> <p data-bbox="894 418 1261 460">Aysa has identified the following matches. Tap each one to see more images for more information.</p> <div data-bbox="804 475 1351 633">  <p data-bbox="1248 601 1330 623">ECIMEN 9 Photos</p> </div> <p data-bbox="833 656 1013 682"><b>Dermatofibroma</b></p> <p data-bbox="833 692 1318 777">A dermatofibroma is a common non-cancerous growth on the skin that is very firm and hard to the touch. This can occur anywhere but is most frequently found on the arms and lower legs.</p> <p data-bbox="833 821 1122 844"><a href="#">More Images and information &gt;</a></p> <div data-bbox="804 903 1351 1062">  <p data-bbox="1281 1024 1330 1045">8 Photos</p> </div> <p data-bbox="833 1085 1139 1110"><b>Polymorphous light eruption</b></p> <p data-bbox="833 1121 1290 1163">Polymorphous light eruption is a reaction seen on the skin of people who are sensitive to sun exposure.</p> <p data-bbox="833 1208 1122 1231"><a href="#">More Images and information &gt;</a></p> <div data-bbox="804 1290 1351 1427">  <p data-bbox="1264 1341 1297 1404">X</p> <p data-bbox="850 1368 1274 1427">       </p> <p data-bbox="1166 1383 1281 1425">Ur... Inf...</p> </div>	
Test Case ID:	TC-22	
Expected Results:	Psoriasis	
Actual Results:	Dermatofibroma	
Execution Date	October 11, 2025	Description: Healthy skin with psoriasis
Performed By:	Gurshan Warya	Pass or Fail: <span style="background-color: green; color: white; padding: 2px;">Pass</span>

Test Case Input		Test Case Results	
		 <div style="background-color: black; color: white; padding: 5px; margin-top: 10px;"> <b>Quality Error</b>            Photo appears dark. Please try again.  <a href="#" style="color: blue;">Retake Photo</a> </div>	
Test Case ID:	TC-23		
Expected Results:	Psoriasis		
Actual Results:	Image too dark		
Execution Date	October 11, 2025	Description: Low-light of psoriasis	
Performed By:	Gurshan Warya	Pass or Fail:	Fail

Test Case Input	Test Case Results
	<p data-bbox="801 333 1339 361"><a href="#">Back</a> <a href="#">Done</a></p> <h3 data-bbox="943 371 1209 403">Possible Conditions</h3> <p data-bbox="894 413 1258 451">Aysa has identified the following matches. Tap each one to see more images for more information.</p> <div data-bbox="801 470 1339 629"> <p data-bbox="894 502 1013 597">  <b>GRAPHIC CONTENT</b> Tap to show images         </p>  <p data-bbox="1263 599 1323 620">31 Photos</p> </div> <p data-bbox="833 650 936 677"><b>Psoriasis</b></p> <p data-bbox="833 690 1318 783">Psoriasis is a persistent skin disease characterized by thick, red skin with white scale. Common areas of involvement include the trunk, elbows, knees, buttocks, navel, hands, and feet. This condition is the result of an overactive immune system attacking the body's own skin cells. It can cause significant physical and emotional distress.</p> <p data-bbox="833 830 1122 855"><a href="#">More Images and information &gt;</a></p> <div data-bbox="801 910 1339 1072">  <p data-bbox="1279 1030 1323 1051">6 Photos</p> </div> <p data-bbox="833 1094 943 1121"><b>Viral rash</b></p> <p data-bbox="833 1132 1318 1220">Viral exanthem is a rash caused by a viral infection. The rash may be nonspecific (cannot tell which virus), or it may be recognizable (can identify the virus) because of the rash's appearance combined with other symptoms.</p> <p data-bbox="833 1265 1122 1290"><a href="#">More Images and information &gt;</a></p>
Test Case ID:	TC-24
Expected Results:	Psoriasis
Actual Results:	Psoriasis
Execution Date	October 11, 2025
Performed By:	Gurshan Warya <span data-bbox="784 1564 959 1590">Pass or Fail:</span> <span data-bbox="1111 1564 1176 1590">Pass</span>

Test Case Input		Test Case Results	
		<p>Aysa has identified the following matches. Tap each one to see more images for more information.</p> <div style="display: flex; justify-content: space-around;">    </div> <p><b>Allergic contact dermatitis</b> Allergic contact dermatitis is a delayed allergic reaction that results in itching, skin redness, and blisters. True contact allergic reactions occur 1-2 days after contact with an allergen. The rash from poison ivy is a type of allergic contact dermatitis.</p> <p><a href="#">More Images and information &gt;</a></p> <div style="display: flex; justify-content: space-around;">  <span style="background-color: pink; padding: 5px; text-align: center;"> <b>GRAPHIC CONTENT</b>            Tap to show images         </span>  </div> <p><b>Poison ivy rash</b> Poison ivy, poison oak, and poison sumac dermatides are all an allergic reaction to the oil found on the leaves and in the stems and roots of poison ivy, poison oak, and poison sumac plants.</p> <p><a href="#">More Images and information &gt;</a></p> <div style="display: flex; justify-content: space-between; align-items: center;"> <span>Newborn Sensory Toys, Personalize... -13%</span> <span>Kindly Toys</span> <span>X</span> </div>	
Test Case ID:	TC-25	Pass or Fail:	Fail
Expected Results:	Psoriasis	Pass or Fail:	Fail
Actual Results:	Eczema	Pass or Fail:	Fail
Execution Date	October 11, 2025	Description: Psoriasis on dark skin tones	
Performed By:	Gurshan Warya	Pass or Fail:	Fail

Test Case Input	Test Case Results	
	<p data-bbox="861 333 1307 361"><a href="#">Back</a> <b>Possible Conditions</b> <a href="#">Done</a></p> <p data-bbox="878 382 1122 405"><a href="#">More Images and information &gt;</a></p> <div data-bbox="861 460 1307 587">  <b>GRAPHIC CONTENT</b>        Tap to show images     </div> <div data-bbox="861 587 1307 608">  </div> <div data-bbox="1220 481 1307 587">  <b>GRAPHIC</b>        Tap to show        31 Photos     </div> <p data-bbox="878 608 964 629"><b>Psoriasis</b></p> <p data-bbox="878 639 1286 720">Psoriasis is a persistent skin disease characterized by thick, red skin with white scale. Common areas of involvement include the trunk, elbows, knees, buttocks, navel, hands, and feet. This condition is the result of an abnormal immune response.</p> <p data-bbox="1237 699 1286 720"><a href="#">... More</a></p> <p data-bbox="878 756 1122 779"><a href="#">More Images and information &gt;</a></p> <div data-bbox="861 834 1307 960">    </div> <p data-bbox="878 982 1111 1003"><b>Lichen simplex chronicus</b></p> <p data-bbox="878 1011 1263 1064">Lichen simplex chronicus is an itchy skin condition in which repeated scratching and rubbing leads to thickened skin.</p> <p data-bbox="878 1100 1122 1123"><a href="#">More Images and information &gt;</a></p> <div data-bbox="861 1178 1307 1305">    </div> <p data-bbox="878 1205 1029 1229">SAS Med Spa</p> <p data-bbox="878 1229 1029 1252">United States</p> <p data-bbox="1171 1220 1253 1243"><a href="#">OPEN &gt;&gt;</a></p>	
Test Case ID:	TC-26	
Expected Results:	Psoriasis	
Actual Results:	Atopic eczema	
Execution Date	October 11, 2025	Description: Psoriasis on low resolution
Performed By:	Gurshan Warya	Pass or Fail: <b>Pass</b>

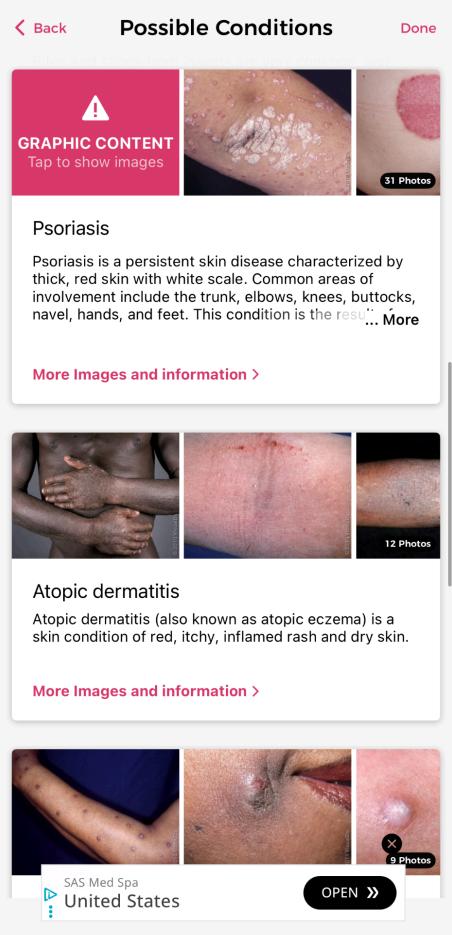
Test Case Input		Test Case Results	
			
Test Case ID:	TC-27		
Expected Results:	Psoriasis		
Actual Results:	Photo too blurry error		
Execution Date	October 11, 2025	Description: Psoriasis on blurry image	
Performed By:	Gurshan Warya	Pass or Fail:	Fail

Test Case Input		Test Case Results	
			
Test Case ID:	TC-28		
Expected Results:	Psoriasis		
Actual Results:	Psoriasis		
Execution Date	October 11, 2025	Description: Psoriasis high resolution image	
Performed By:	Gurshan Warya	Pass or Fail:	Pass

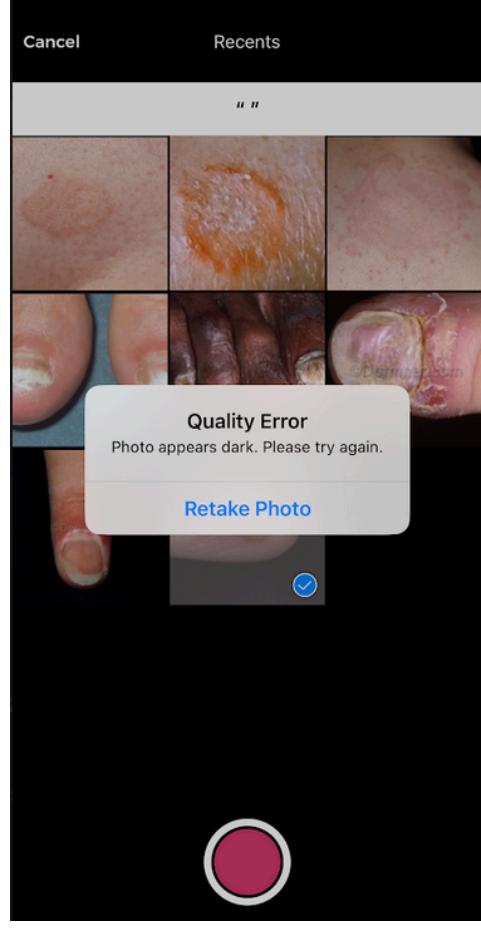
Test Case Input		Test Case Results	
		<p><b>Possible Conditions</b></p> <p><b>Possible Conditions</b></p> <p>Aysa has identified the following matches. Tap each one to see more images for more information.</p> <div style="display: flex; justify-content: space-around;">    <span>12 Photos</span> </div> <p><b>Atopic dermatitis</b></p> <p>Atopic dermatitis (also known as atopic eczema) is a skin condition of red, itchy, inflamed rash and dry skin.</p> <p><a href="#">More Images and information &gt;</a></p> <div style="display: flex; justify-content: space-around;">    <span>6 Photos</span> </div> <p><b>Lichen simplex chronicus</b></p> <p>Lichen simplex chronicus is an itchy skin condition in which repeated scratching and rubbing leads to thickened skin.</p> <p><a href="#">More Images and information &gt;</a></p> <div style="display: flex; justify-content: space-around;">    <span>X</span> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;">      <span>Ur... Inf...</span> </div>	
Test Case ID:	TC-29		
Expected Results:	Psoriasis		
Actual Results:	Atopic dermatitis		
Execution Date	October 11, 2025	Description: Psoriasis on light skin	
Performed By:	Gurshan Warya	Pass or Fail:	Fail

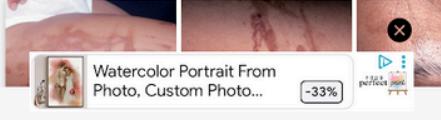
Test Case Input	Test Case Results	
	<p data-bbox="866 312 1290 340"><b>Possible Conditions</b></p> <p data-bbox="882 371 1111 392"><a href="#">More Images and information &gt;</a></p> <div data-bbox="866 435 1290 551">    <p data-bbox="866 487 1029 508">GRAPHIC CONTENT</p> <p data-bbox="866 508 1029 530">Tap to show images</p> <p data-bbox="1233 487 1290 508">GRAPHIC</p> <p data-bbox="1233 508 1290 530">Tap to show</p> <p data-bbox="1241 530 1282 551">31 Photos</p> </div> <p data-bbox="882 572 964 593">Psoriasis</p> <p data-bbox="882 604 1266 684">Psoriasis is a persistent skin disease characterized by thick, red skin with white scale. Common areas of involvement include the trunk, elbows, knees, buttocks, navel, hands, and feet. This condition is the result of... <a href="#">More</a></p> <p data-bbox="882 715 1111 737"><a href="#">More Images and information &gt;</a></p> <div data-bbox="866 779 1290 895">    <p data-bbox="866 846 1290 868">6 Photos</p> </div> <p data-bbox="882 916 1103 937">Lichen simplex chronicus</p> <p data-bbox="882 946 1241 1005">Lichen simplex chronicus is an itchy skin condition in which repeated scratching and rubbing leads to thickened skin.</p> <p data-bbox="882 1036 1111 1058"><a href="#">More Images and information &gt;</a></p> <div data-bbox="866 1100 1290 1184">    <p data-bbox="915 1132 1029 1153">SAS Med Spa</p> <p data-bbox="915 1153 1029 1174">United States</p> <p data-bbox="1160 1132 1233 1153">OPEN &gt;</p> </div>	
Test Case ID:	TC-30	
Expected Results:	Psoriasis	
Actual Results:	Atopic eczema	
Execution Date	October 11, 2025	Description: Psoriasis on low resolution
Performed By:	Gurshan Warya	Pass or Fail: <span style="background-color: green; color: white; padding: 2px;">Pass</span>

Test Case Input		Test Case Results	
		<p><b>Possible Conditions</b></p> <p><b>Psoriasis</b></p> <p>Psoriasis is a persistent skin disease characterized by thick, red skin with white scale. Common areas of involvement include the trunk, elbows, knees, buttocks, navel, hands, and feet. This condition is the <a href="#">rest</a>... <a href="#">More</a></p> <p><a href="#">More Images and information &gt;</a></p> <p><b>Atopic dermatitis</b></p> <p>Atopic dermatitis (also known as atopic eczema) is a skin condition of red, itchy, inflamed rash and dry skin.</p> <p><a href="#">More Images and information &gt;</a></p>	
Test Case ID:	TC-31		
Expected Results:	Psoriasis		
Actual Results:	Psoriasis		
Execution Date	October 11, 2025	Description: Large psoriasis coverage	
Performed By:	Gurshan Warya	Pass or Fail:	Pass

Test Case Input		Test Case Results	
		<p><b>Possible Conditions</b></p> 	
Test Case ID:	TC-32		
Expected Results:	Psoriasis		
Actual Results:	Psoriasis		
Execution Date	October 11, 2025	Description: Small psoriasis	
Performed By:	Gurshan Warya	Pass or Fail:	Pass

### 3.3.4 Fungal Infection

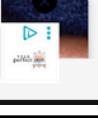
Test Case Input		Test Case Results	
			
Test Case ID:	TC-33		
Expected Results:	Fungal Infection		
Actual Results:	Quality Error		
Execution Date	October 11, 2025	Description: Fungal Infection Dark Lighting	
Performed By:	Brandon Arriaga	Pass or Fail:	Fail

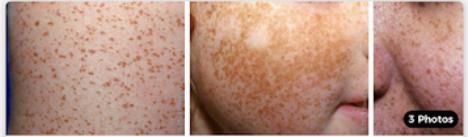
Test Case Input		Test Case Results	
		<p><a href="#">Back</a>    <b>Possible Conditions</b>    <a href="#">Done</a></p>  <p><b>Ringworm of body</b> Tinea corporis (also known as ringworm) is a common fungal infection of the surface skin. It can be spread to others.</p> <p><a href="#">More Images and information &gt;</a></p>  <p><b>Erythema ab igne</b> In erythema ab igne (also known as EAI), the skin is darker and has a lacy pattern where it has been exposed to heat for a long period of time, such as from a heating pad, laptop, electric blanket, or sitting near a wood stove.</p> <p><a href="#">More Images and information &gt;</a></p> 	
Test Case ID:	TC-34		
Expected Results:	Fungal Infection		
Actual Results:	Fungal Infection		
Execution Date	October 11, 2025	Description: Well Lit Spread Fungal Infection (Ringworm)	
Performed By:	Brandon Arriaga	Pass or Fail:	Pass

Test Case Input		Test Case Results	
		<p><a href="#">Back</a>    <b>Possible Conditions</b>    <a href="#">Done</a></p> <div style="display: flex; justify-content: space-around;">    <span>6 Photos</span> </div> <p><b>Hives</b></p> <p>Urticaria (also known as hives) is a common skin condition with itchy, pink to red bumps that appear and disappear anywhere on the body.</p> <p><a href="#">More Images and information &gt;</a></p> <div style="display: flex; justify-content: space-around;">    <span>4 Photos</span> </div> <p><b>Blue nevus</b></p> <p>Blue nevi (also known as blue moles) are smooth blue, blue-gray, or blue-black growths in the skin. These moles are non-cancerous, but they look similar to cancerous growths.</p> <p><a href="#">More Images and information &gt;</a></p> <p>Aysa covers common skin conditions. This is only part of the full scope of skin diseases. When in doubt, have a healthcare professional</p> <div style="text-align: center;">  <span>▶</span> <span>⋮</span> <span>◀</span> </div>	
Test Case ID:	TC-35	Actual Results:	Fungal Infection
Expected Results:	Fungal Infection	Execution Date	October 11, 2025
Performed By:	Brandon Arriaga	Pass or Fail:	Pass

Test Case Input		Test Case Results	
 -fungal.jpg		<p><a href="#">Back</a>   <b>Possible Conditions</b>   <a href="#">Done</a></p> <p>poison ivy is a type of allergic contact dermatitis.</p> <p><a href="#">More Images and information &gt;</a></p> <div style="display: flex; justify-content: space-around;">    <span>5 Photos</span> </div> <p><b>Solar lentigo</b></p> <p>A solar lentigo (also known as an age spot) is a light or dark spot on the skin caused by artificial or natural sunlight exposure. These skin spots are non-cancerous.</p> <p><a href="#">More Images and information &gt;</a></p> <div style="display: flex; justify-content: space-around;">    <span>10 Photos</span> </div> <p><b>Ringworm of body</b></p> <p>Tinea corporis (also known as ringworm) is a common fungal infection of the surface skin. It can be spread to others.</p> <p><a href="#">More Images and information &gt;</a></p> <div style="display: flex; align-items: center;">  <span>Watercolor Portrait From Photo, Custom Photo...</span> <span>-33%</span> <span>perfect photo</span> </div>	
Test Case ID:	TC-36		
Expected Results:	Fungal Infection		
Actual Results:	Fungal Infection		
Execution Date	October 11, 2025	Description: Healthy Skin	
Performed By:	Brandon Arriaga	Pass or Fail:	Pass

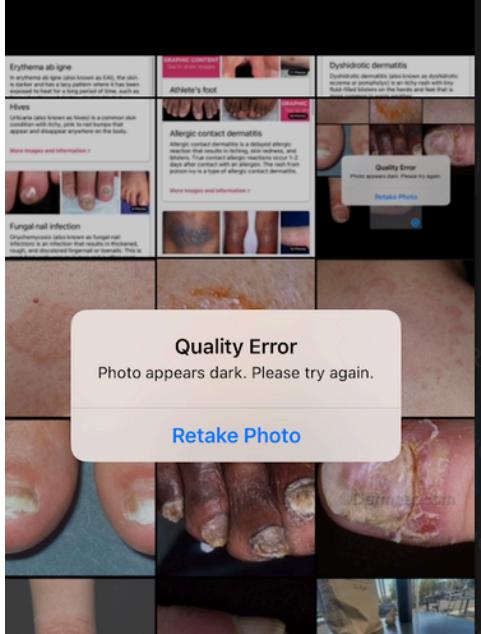
Test Case Input		Test Case Results	
		<p><a href="#">Back</a>    <b>Possible Conditions</b>    <a href="#">Done</a></p> <b>Hives</b> Urticaria (also known as hives) is a common skin condition with itchy, pink to red bumps that appear and disappear anywhere on the body. <a href="#">More Images and information &gt;</a>	
Test Case ID:	TC-37		
Expected Results:	Fungal Infection		
Actual Results:	Fungal Infection	<p><b>Fungal nail infection</b></p> <p>Onychomycosis (also known as fungal nail infection) is an infection that results in thickened, rough, and discolored fingernail or toenails. This is most frequently occurs in men and is often seen along with athlete's foot (tinea pedis).</p> <p><a href="#">More Images and information &gt;</a></p>	
Execution Date	October 11, 2025	Description: Fungal Infection Dark skin tone	
Performed By:	Brandon Arriaga	Pass or Fail:	Pass

Test Case Input		Test Case Results	
		<p>◀ Back    Possible Conditions    Done</p> <h3>Possible Conditions</h3> <p>Aysa has identified the following matches. Tap each one to see more images for more information.</p> <div style="display: flex; justify-content: space-around;">    <span>8 Photos</span> </div> <p><b>Pediatric scabies</b></p> <p>Scabies is an infestation of the skin caused by a mite (a tiny tick-like organism) that causes an extremely itchy rash.</p> <p><a href="#">More Images and information &gt;</a></p> <div style="display: flex; align-items: center;"> <span style="color: red;">⚠ GRAPHIC CONTENT</span> <span style="margin-left: 10px;">Tap to show images</span> </div> <div style="display: flex; justify-content: space-around;">    <span>11 Photos</span> </div> <p><b>Athlete's foot</b></p> <p>Tinea pedis (also known as athlete's foot) is an itchy fungal infection on the feet that can be spread to other people.</p> <p><a href="#">More Images and information &gt;</a></p> <div style="display: flex; justify-content: space-between;">    </div>	
Test Case ID:	TC-38		
Expected Results:	Fungal Infection		
Actual Results:	Fungal Infection		
Execution Date	October 11, 2025	Description: Fungal Infection Lighter skin tone	
Performed By:	Brandon Arriaga	Pass or Fail:	Pass

Test Case Input		Test Case Results	
		<p>Back    Possible Conditions    Done</p>  <p><b>Ringworm of body</b> Tinea corporis (also known as ringworm) is a common fungal infection of the surface skin. It can be spread to others.</p> <p><a href="#">More Images and information &gt;</a></p>  <p><b>Freckles</b> Freckles (also known as ephelides) are small, brown spots on the sun-exposed areas of skin. They first appear in childhood.</p> <p><a href="#">More Images and information &gt;</a></p> 	
Test Case ID:	TC-39		
Expected Results:	Fungal Infection		
Actual Results:	Fungal Infection		
Execution Date	October 11, 2025	Description: Minor single spot Fungal Infection	
Performed By:	Brandon Arriaga	Pass or Fail:	Pass

Test Case Input	Test Case Results
	<p data-bbox="861 382 1307 409"><a href="#">Back</a> <a href="#">Done</a></p> <h3 data-bbox="948 424 1225 454">Possible Conditions</h3> <p data-bbox="866 466 1302 508">Aysa has identified the following matches. Tap each one to see more images for more information.</p> <div data-bbox="861 530 1307 663">    <span data-bbox="1253 629 1307 650">10 Photos</span> </div> <p data-bbox="878 684 1086 713"><b>Ringworm of body</b></p> <p data-bbox="878 720 1299 783">Tinea corporis (also known as ringworm) is a common fungal infection of the surface skin. It can be spread to others.</p> <p data-bbox="878 821 1135 844"><a href="#">More Images and information &gt;</a></p> <div data-bbox="861 895 1307 1028">    <span data-bbox="1263 1001 1307 1022">6 Photos</span> </div> <p data-bbox="878 1049 948 1079"><b>Hives</b></p> <p data-bbox="878 1085 1277 1148">Urticaria (also known as hives) is a common skin condition with itchy, pink to red bumps that appear and disappear anywhere on the body.</p> <p data-bbox="878 1186 1135 1210"><a href="#">More Images and information &gt;</a></p> <div data-bbox="861 1260 1307 1339">    <span data-bbox="1253 1269 1286 1290">X</span> <span data-bbox="1253 1296 1302 1317">&gt; ::</span> </div>
Test Case ID:	TC-40
Expected Results:	Fungal Infection
Actual Results:	Fungal Infection
Execution Date	October 11, 2025
Performed By:	Brandon Arriaga
Pass or Fail:	Pass

Test Case Input		Test Case Results	
		<p><b>Possible Conditions</b></p> <p><b>Athlete's foot</b> Tinea pedis (also known as athlete's foot) is an itchy fungal infection on the feet that can be spread to other people.</p> <p><a href="#">More Images and information &gt;</a></p>  <p><b>Scabies</b> Scabies is an infestation of the skin caused by a mite (a tiny tick-like organism) that causes an extremely itchy rash.</p> <p><a href="#">More Images and information &gt;</a></p> 	
Test Case ID:	TC-41		
Expected Results:	Fungal Infection		
Actual Results:	Fungal Infection		
Execution Date	October 11, 2025	Description: High Lighting Conditions	
Performed By:	Brandon Arriaga	Pass or Fail:	Pass

Test Case Input	Test Case Results	
 ©Dermnet.com	 <p><b>Quality Error</b> Photo appears dark. Please try again.</p> <p><b>Retake Photo</b></p>	
Test Case ID:	TC-42	
Expected Results:	Fungal Infection	
Actual Results:	Quality Error	
Execution Date	October 11, 2025	Description: Lower Lighting Conditions
Performed By:	Brandon Arriaga	Pass or Fail: <b>Fail</b>

Test Case Input		Test Case Results	
		<p>◀ Back    Possible Conditions    Done</p>  <p><b>Ringworm of body</b> Tinea corporis (also known as ringworm) is a common fungal infection of the surface skin. It can be spread to others.</p> <p><a href="#">More Images and information &gt;</a></p>  <p><b>Lichen planus</b> Lichen planus (also known as LP) is an itchy, inflamed rash that looks like small, flat-topped, red or purple bumps.</p> <p><a href="#">More Images and information &gt;</a></p> 	
Test Case ID:	TC-43		
Expected Results:	Fungal Infection		
Actual Results:	Fungal Infection		
Execution Date	October 11, 2025	Description: Minimum Image Resolution Fungal Infection	
Performed By:	Brandon Arriaga	Pass or Fail:	Pass

Test Case Input		Test Case Results	
		<p><a href="#">Back</a>    <b>Possible Conditions</b>    <a href="#">Done</a></p>  <p><b>Ringworm of body</b> Tinea corporis (also known as ringworm) is a common fungal infection of the surface skin. It can be spread to others.</p> <p><a href="#">More Images and information &gt;</a></p>  <p><b>Fixed drug eruption</b> A drug eruption is a rash caused by a medication. In a fixed drug eruption (also known as FDE), the rash appears in the same body location every time the medicine is taken.</p> <p><a href="#">More Images and information &gt;</a></p> 	
Test Case ID:	TC-44		
Expected Results:	Fungal Infection		
Actual Results:	Fungal Infection		
Execution Date	October 11, 2025	Description: Maximum Image Resolution Fungal Infection	
Performed By:	Brandon Arriaga	Pass or Fail:	Pass

### 3.4 Test Case Analysis

Total	Melanoma	Eczema	Psoriasis	Fungal Infection
Pass Rate	8/12	10/12	7/12	10/12
Pass Percentage	66.67%	83.3%	58.3%	83.30%

### Overall Test Case Result

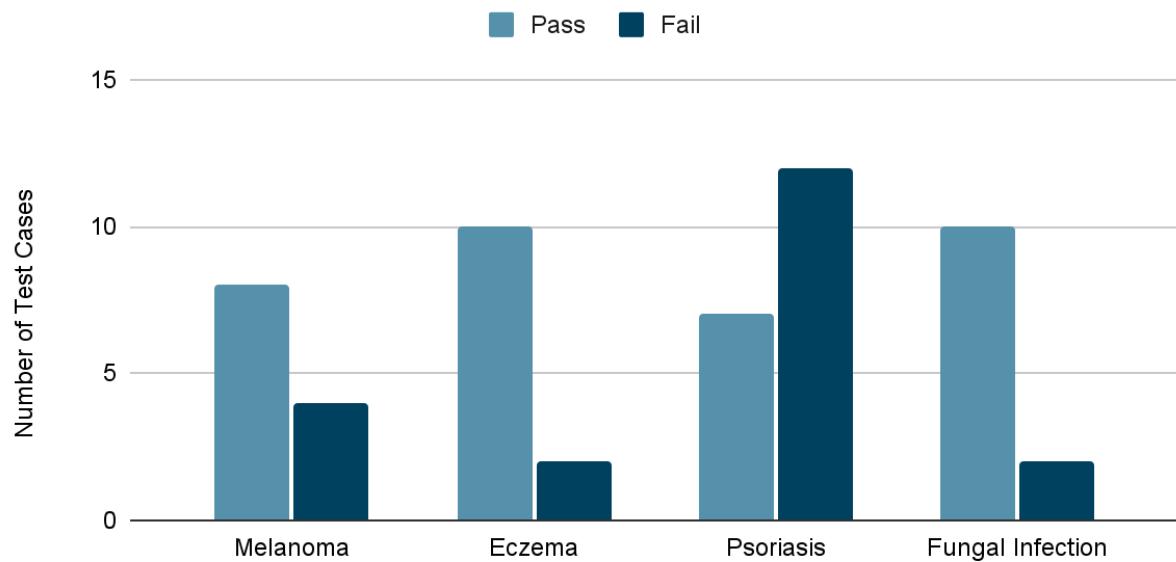


Figure 3.1 Overall Test Cases Results

Total	Melanoma	Eczema	Psoriasis	Fungal Infection
Context Pass Percentage	66.67%	83.3%	66.7%	83.3%
Input Pass Percentage	66.67 %	83.3%	50%	83.3%

## Context and Input Test Case Result

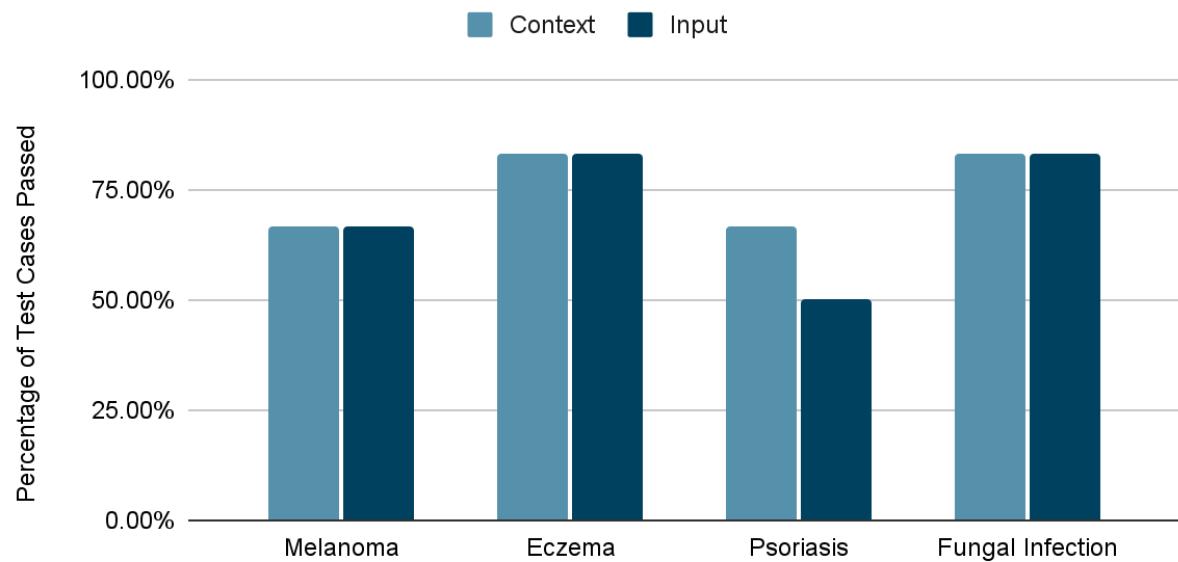


Figure 3.2 Context and Input Test Cases Result

Context	Melanoma	Eczema	Psoriasis	Fungal Infection
Lighting Condition Pass Rate	66.67 %	85.7%	0%	83.3%
Photo Condition Pass Rate	100%	80%	75%	100%
Pass Rate	66.67%	83.3%	50%	83.3%

## Context Test Case Result

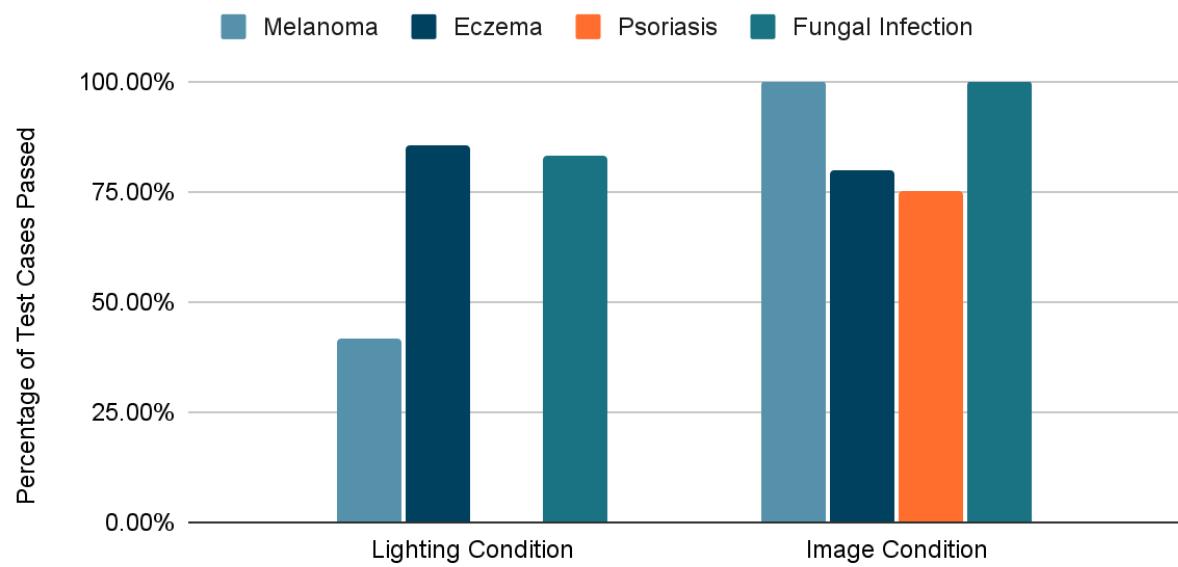


Figure 3.3 Context Test Case Result

Input	Melanoma	Eczema	Psoriasis	Fungal Infection
Body Part Pass Rate	66.67%	66.7%	100%	100%
Skin Tone Pass Rate	41.67 %	88.9%	50%	100%
Pass Percentage	66.67%	83.3%	66.7%	100%

## Input Test Case Result

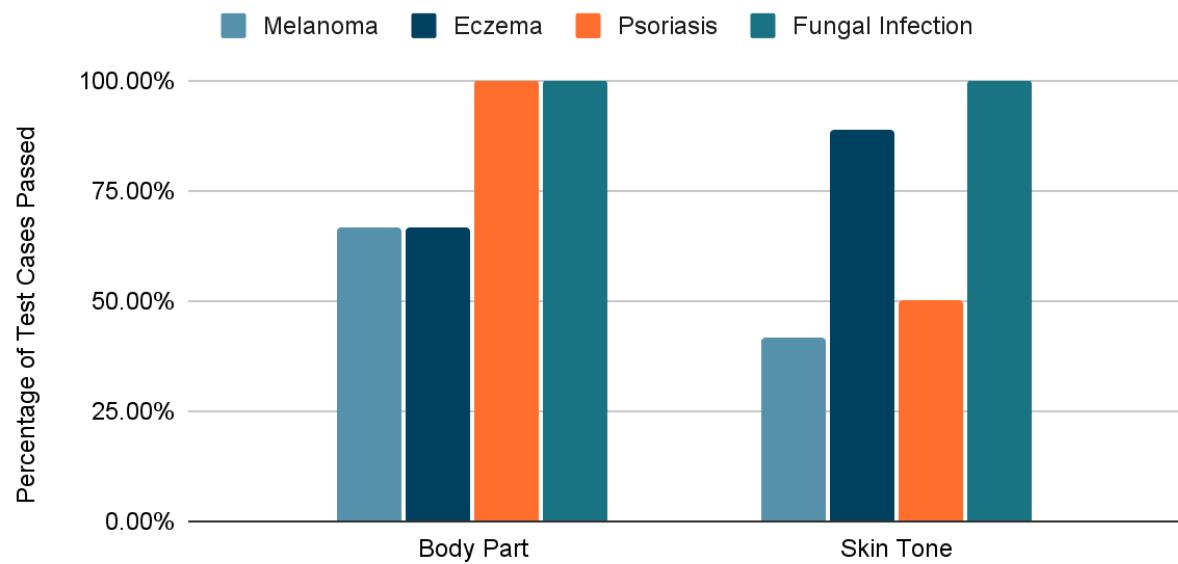


Figure 3.4 Input Test Case Result

## 4 - AI Function Test Results and Test Criteria

### 4.1 AI Test Model-Based Test Results Analysis, Complexity, and Statistics

#### 4.1.1 Melanoma

The Aysa application was evaluated using 12 test cases that were created using the AI testing tool to determine its accuracy in diagnosing melanoma under varying conditions. The four primary factors tested were: skin tone, lighting conditions, image quality, and body part. Out of the 12 test cases, Aysa diagnosed 8 cases correctly. The most significant contributor to failed test cases was the skin tone, which was responsible for 75% of the failed test cases.

#### **Context Complexity:**

Environmental conditions, especially lighting, had a slight effect on the performance of Aysa. With the failed test cases, it can be observed that low lighting conditions do have an effect on the performance of the application. Out of the four failed test cases: two were low light(Test cases: 04, and 07), one was normal light(Test case 08), and one was bright lighting conditions(Test case: 09). This indicates that 50% of failed test cases are due to low lighting. Out of the 12 test cases, 8 test cases where context factors were tested passed.

#### **Input Feature Complexity:**

The input factor with the greatest impact on the results was the skin tone. Out of the four failed test cases, three were due to dark skin tones, this leads to a 75% of failed test cases being due to skin tone input factor. In every scenario that included dark skin tones, Aysa failed to diagnose melanoma correctly(Test cases: 07, 08, and 09). This leads to the results that 100% of the dark skin tone test cases failed.

#### **Overall Statistical Summary:**

Overall Pass rate: 66.67 %

Context pass rate: 66.67 %

Input pass rate: 66.67 %

#### **4.1.2 Eczema**

A set of 12 systematically designed test cases, deriving from the Eczema context and input trees were used to evaluate the Eczema AI-powered diagnostic function. These scenarios were based on lighting, photo quality, body part, and skin tone. Aysa was able to correctly diagnose 10 out of the 12 cases, approximately 83.3%. The two failures stemmed from situations where the image quality (low lighting and angled photos) made it harder for the model to detect.

#### **Context Complexity:**

Context factors such as lighting and photo condition had a huge impact on the app's diagnostic performance. The machine learning model performed reliably under normal and bright lighting conditions, achieving a 100% pass rate within these contexts. Its accuracy dropped significantly, down to 50% under low lighting, demonstrating its sensitivity to illumination. This similar behavior is evident in photo condition metrics, where clear, center/cropped, and distance-based photos had 100% accuracy, while angled images introduced classification errors.

#### **Input Feature Complexity:**

The results from input factors were mostly positive but still contained a weak spot. The app performed exceptionally well on body and light/moderate skin tones, with a yield of 100% accuracy. There was a slight decrease for the extremities to 66.7% accuracy, and dark skin tone images produced the highest rate of failure with a pass rate of 50%. The model struggles when lesion visibility is reduced due to both lighting and melanin density.

#### **Statistical Summary:**

- Overall Pass Rate: 83.3%
- Context Pass Rate: 83.3%
- Input Pass Rate: 83.3%

Lighting Failure Patterns: All failures occurred under low lighting conditions

Skin Tone Sensitivity: Dark skin tones appeared in both cases of failure

#### **4.1.3 Psoriasis**

We evaluated Aysa using a set of 12 cases to determine accuracy in diagnosing psoriasis under different conditions. Based on our results, the system recorded a pass rate of approximately

58.3% (7 of 12 cases passed). The failures were categorized into image quality errors and classifying the diagnosis incorrectly.

**Context Complexity:** Environmental factors and image capture conditions affected the application's performance greatly. The application seemed to be very sensitive to lighting, which we can see in the failure of test case TC-23 ("Low-light of psoriasis") and TC-21 ("Clear skin"), both of which returned a "Quality Error" message because the images were too dark. Image quality also affected our results, where blurring the images greatly reduced correct detections, such as in test case TC-27 resulting in "Quality Error" stating the photo was too blurry to process. The model also appeared to be much better with lower resolutions, as test cases for high resolution (TC-28) and low resolution (TC-26, TC-30) passed.

**Input Feature Complexity:** The model struggled to accurately diagnose on specific skin tones leading to misclassification errors. The application failed to correctly identify psoriasis on dark skin in test case TC-25, misdiagnosing it as Eczema. Misdiagnosis also occurred on light skin as demonstrated by test case TC-29 which failed when the application identified the condition as Atopic dermatitis instead of Psoriasis.

### Statistical Summary

- Overall Pass Rate: 58.3%
- Context Pass Rate: 50%
- Input Pass Rate: 66.7%

Lighting and blur: All failures occurred under low lighting and blurry conditions.

Skin Tone Sensitivity: Dark and light skin tones resulted in misdiagnosis.

#### 4.1.4 Fungal Infection

After utilizing the Aysa computer vision application to evaluate 12 test cases, the AI testing tool was then used to determine the accuracy of Aysa in diagnosing Fungal Infections under varying conditions for multiple image inputs. Four primary factors were tested when providing input, these four factors were: skin tone, lighting conditions, image quality, and specific body part. For fungal infection, out of the 12 cases, 10 of them were diagnosed correctly. It seemed that Aysa

seemed to correctly identify fungal infection or certain types of fungal infections such as ringworm but struggled when it came to lighting conditions of the image.

### **Context Complexity:**

For many other skin diseases, Aysa seemed to be affected by environmental conditions such as body type or skin tone. However, when it came to fungal infections, Aysa easily observed images and identified fungal infections correctly despite body type or skin tone. Even with images of different contexts and factors such as extensive fungal infections or darker skin tones, it was able to identify a type of fungal infection or general fungal infection. Though, when it came to image lighting, it struggled with even taking in the input and providing a diagnosis. Test cases 33 and 42 failed due to lighting conditions, where Aysa, instead of providing an actual diagnosis, prompted the user to provide a new image due to quality errors. This indicates that only 17% of these test cases failed due to the low lighting, out of the 12 test cases, 10 passed in terms of context factors.

### **Input Feature Complexity:**

The input factor with the greatest impact on results was purely just the lighting condition of images. As previously mentioned, only 2 test cases failed, due to quality issues within the input images. This led to a 17% failed test cases due to lighting input factors in regards to all test cases (12 test cases). Aysa only seemed to struggle with diagnosing fungal infection entirely due to lighting factors and wouldn't prompt the user further. 100% of those failed test cases were purely just due to lighting.

### **Overall Statistical Summary:**

Overall Pass rate for fungal infection: 83.30%

Context Pass Rate: 83.30%

Input Pass Rate: 83.30%

Lighting Failure Patterns: All failures occurred under the low lighting conditions, causing a quality error within Aysa.

No other errors for skin tone or body parts.

## 4.2 AI Function Bug Analysis

During the testing of Aysa for melanoma, eczema, psoriasis, and fungal infections the following bugs were reported:

- **Incorrect diagnoses** were most frequent in test cases where the image contained low lighting or dark skin tones.
- Aysa **failed to accept** the image when the lighting conditions were too low.

## 4.3 AI Function Test Quality Assessment

### 4.3.1 Test Criteria

Test cases were evaluated on these dimensions:

1. Functional Correctness
2. Completeness of Output
3. Robustness
4. Consistency

Many domain-specific expectations or constraints:

- Image Lighting
- Body Types
- Skin Tones

### 4.3.2 Test Coverage

The AI test model achieved a high coverage across these modules:

- Context Coverage: Lighting, image condition, resolution, body part, skin tone.
- Input Feature Coverage: inputs covered within many skin tones, conditions, extreme edge conditions, and ambiguous conditions.
- Condition Coverages: Standard cases, Edge cases, Ambiguous/misleading cases.

Coverage was ensured through the AI testing framework using:

- Hierarchical context/input/output trees
- Decision tables mapping inputs to expected responses.