# 1. Introduction

## 1.1 Overview

Skin problems are among the most common health concerns, yet they are often underestimated or ignored by people. Many individuals avoid visiting a dermatologist for small or early-stage issues due to lack of awareness, hesitation, or inconvenience. Instead, they frequently turn to the internet in search of solutions. However, searching online usually creates confusion, as people encounter numerous and sometimes contradictory remedies, making it difficult to identify what is reliable and relevant to their condition. This often leads to delayed treatment, worsening of the issue, or unnecessary anxiety.

To address this problem, advancements in Artificial Intelligence (AI) and Machine Learning (ML) can play a significant role. With the ability to analyze images and patterns, AI-powered systems can provide quick, preliminary insights into possible conditions. Such systems are not meant to replace medical professionals but can act as a supportive tool for awareness and guidance.

This project, **DermaScan AI** a skin Disease Prediction System, has been developed as a step toward this solution. The system allows users to upload an image of their skin concern, provide details such as symptoms and duration, and receive an AI-based prediction of possible skin conditions. Alongside the prediction, the system also offers general, common solutions or recommendations that may help in early care. Importantly, this platform includes a disclaimer that it is for educational purposes only and should not be considered a replacement for professional diagnosis or treatment.

## 1.2 Objective

The main objective of this project is to provide a simple yet effective solution that bridges the gap between individuals experiencing skin-related issues and the availability of initial guidance. The system has been designed with the following goals in mind:

1. **AI-Powered Skin Condition Prediction**
    - To leverage Artificial Intelligence (AI) and Machine Learning (ML) models for predicting potential skin conditions by analyzing uploaded skin images.
    - To combine user-provided details such as symptoms and duration with image data, thereby improving the accuracy and relevance of the predictions.
2. **Provide General and Common Solutions**
    - To offer basic, general recommendations or preventive measures that can help individuals manage minor skin concerns.
    - To ensure that these solutions are easy to understand, accessible, and encourage good skin care practices.
3. **Reduce Reliance on Unreliable Online Information**
    - To minimize confusion created by multiple, contradictory online sources by providing structured and consistent outputs.
    - To act as a trustworthy educational platform for raising awareness about skin health.
4. **Encourage Early Action and Awareness**
    - To motivate individuals not to ignore skin-related issues and instead take timely action based on the preliminary insights.
    - To encourage users to seek professional medical advice when necessary, while highlighting the importance of early care.
5. **User-Friendly and Accessible Platform**
    - To design a platform that is simple, intuitive, and can be easily used by people with minimal technical knowledge.
    - To ensure the system is lightweight and accessible across devices, making it practical for real-world usage.

# 2. Project Planning and Scheduling

## 2.1 Feasibility Study

**1. Technical Feasibility**

- The project is developed using Python along with AI/ML libraries and the Flask framework, which are reliable, well-documented, and widely used technologies. This ensures that the system is technically sound and can be easily extended in the future.
- Since the project requires only basic hardware and internet connectivity, it can run efficiently on a normal personal computer without requiring high-end servers or GPUs, making it technically feasible for academic and small-scale deployment.
- The modular design of the code allows for future scalability and integration with cloud platforms or advanced APIs, which means the system can be upgraded with minimal changes.

**2. Economic Feasibility**

- The entire project is built using free and open-source tools such as Python, Flask, and open datasets, which eliminates the need for costly software licenses or specialized hardware.
- The development costs are minimal, as the project was implemented on a personal system without additional infrastructure investments, making it highly economical for students or small organizations.
- Since it can run on existing low-cost systems and requires no recurring expenses, the project offers a cost-effective solution for skin concern analysis compared to commercial tools.

**3. Operational Feasibility**

- The system provides a simple, user-friendly interface where users can upload images, report symptoms, and instantly receive predictions with general recommendations. This makes the system easy to operate even for non-technical users.

- The project is designed with a clear disclaimer that it is an educational tool, not a replacement for medical advice. This ensures responsible use and sets the right expectations for end-users.
- Since the predictions are presented in an easy-to-understand format with general solutions, users can confidently interact with the tool without requiring prior technical knowledge, making the system operationally practical.

**Conclusion**

From the feasibility analysis, it is clear that the proposed skin concern prediction system is technically, economically, and operationally viable. Technically, the use of Python, Flask, and AI/ML libraries ensures reliable performance and future scalability without requiring advanced infrastructure. Economically, the reliance on open-source tools and low-cost hardware makes the project affordable and sustainable. Operationally, the system offers a simple and user-friendly interface, making it accessible even for non-technical users while maintaining transparency through disclaimers.

Thus, the project stands as a practical and cost-effective solution for providing users with quick insights into their skin concerns, bridging the gap between self-assessment and professional consultation.

## 2.2 Activity Chart

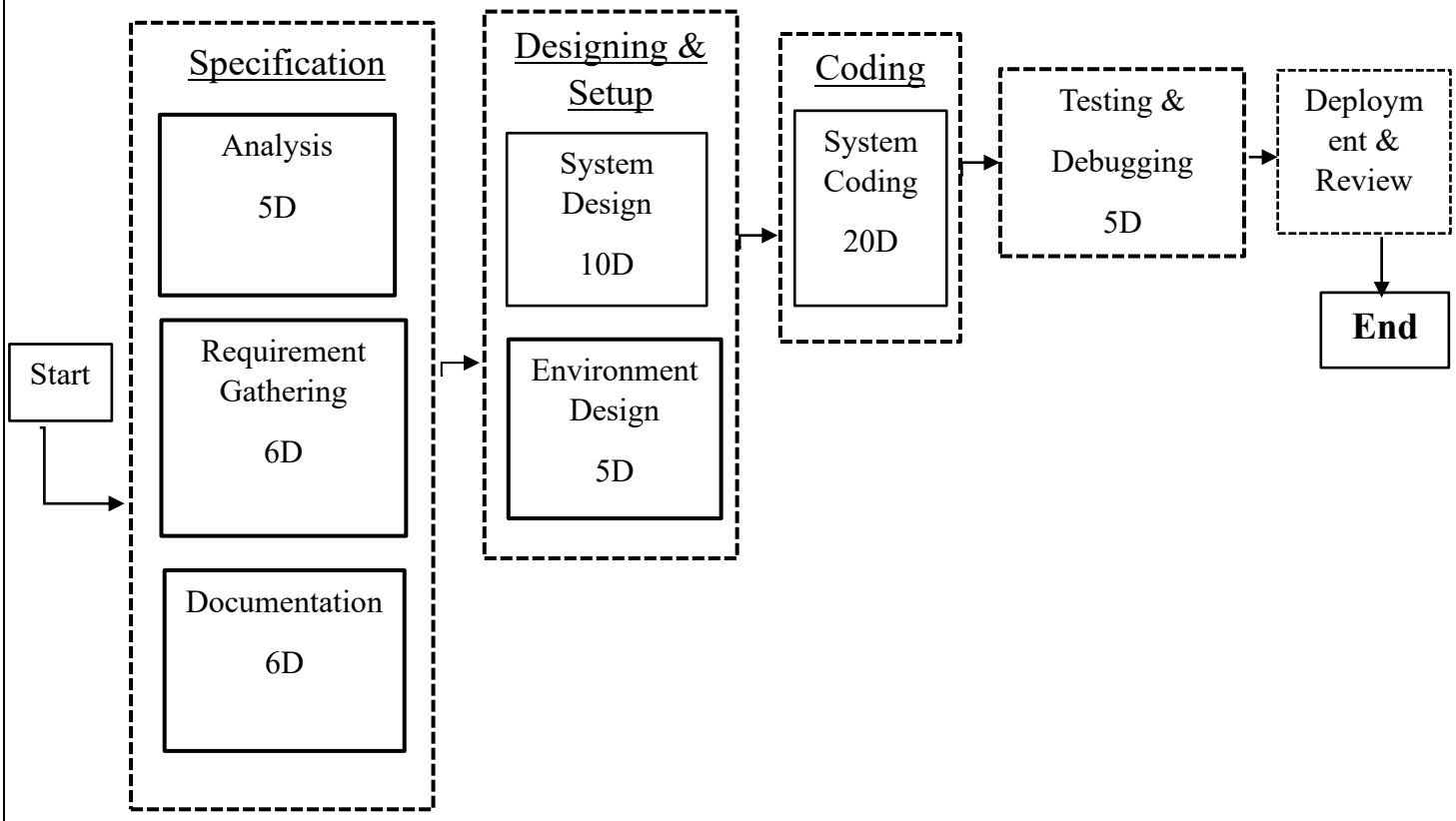


Figure 2.2.1

## 2.3 Gantt Chart

| S No | Task name | Start Date | End Date | Duration | 10 15 | 15 20 | 21 30 | 01 10 | 11 20 | 21 25 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Analysis | 10/06/25 | 15/06/25 | 5D | | | | | | |
| 2 | Requirement Gathering | 10/06/25 | 16/06/25 | 6D | | | | | | |
| 3 | Documentation | 10/06/25 | 16/06/25 | 6D | | | | | | |
| 4 | System Design | 17/06/25 | 27/06/25 | 10D | | | | | | |
| 5 | Environment Setup | 22/06/25 | 27/06/25 | 5D | | | | | | |
| 6 | System Coding | 28/06/25 | 17/07/25 | 20D | | | | | | |
| 7 | Testing & Debugging | 18/07/25 | 22/08/25 | 5D | | | | | | |
| 8 | Deployment & Review | 22/07/25 | 25/07/25 | 4D | | | | | | |

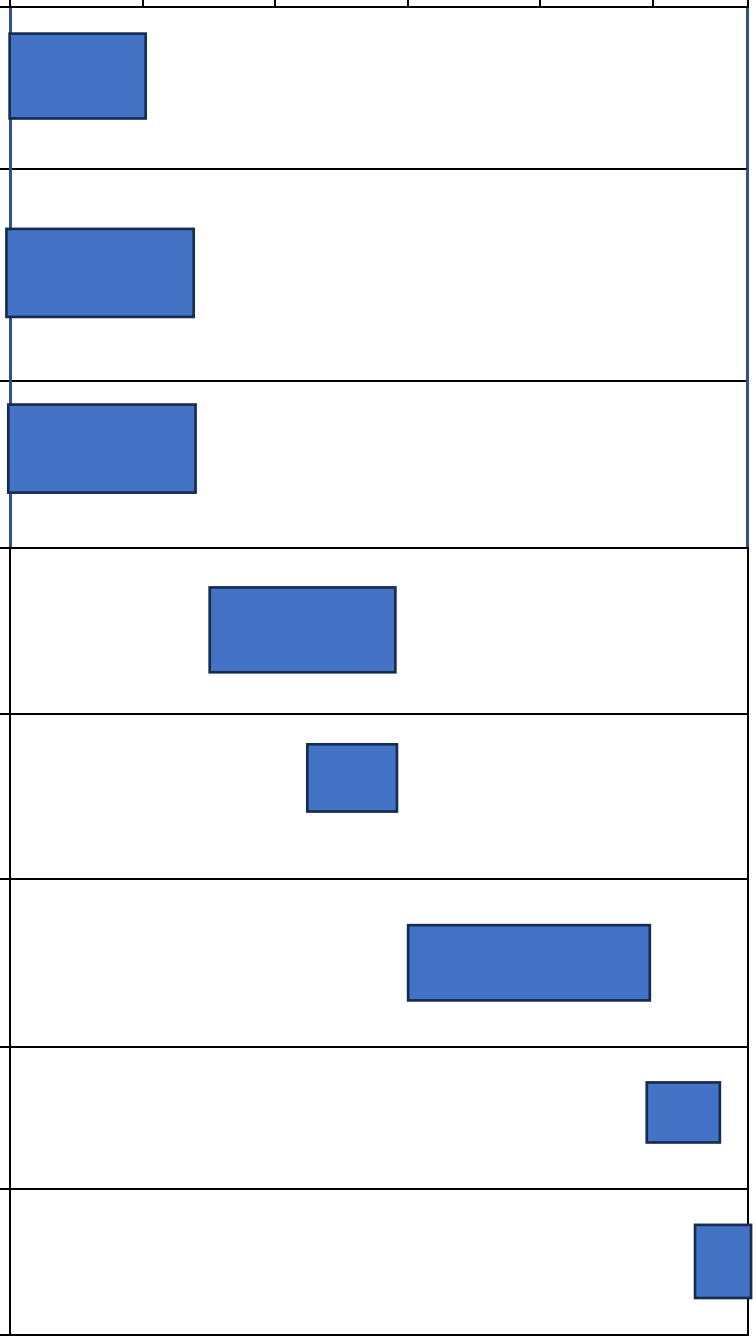

Figure 2.3.1

# 3. System Analysis

## 3.1 SDLC Model (Waterfall Model)

### 3.1.1 Waterfall Model Overview

The Waterfall Model follows a sequential development process, where each phase must be completed before moving on to the next. It's best suited for projects with well-defined requirements and limited scope, like our bakery website. The model consists of the following phases:

1. Requirement Gathering
2. System Design
3. Implementation (Coding)
4. Testing
5. Deployment
6. Maintenance

### 3.1.2 Phases of the Waterfall Model for Sweet Treat Bakery Website:

1. Requirement Gathering

- The first step involved understanding the core problem: many individuals tend to ignore minor skin issues or hesitate to consult a doctor.
- People often search online for solutions, but the abundance of information creates confusion.
- Hence, we gathered requirements for a system that can:
    - Allow users to upload a skin image.
    - Enable input of symptoms and duration.
    - Provide possible skin concern predictions.
    - Suggest general remedies and solutions.

2. System Design

- After finalizing the requirements, we designed the architecture of the system.
- The design stage included:
    - Frontend design using HTML, CSS, and JavaScript to make the interface user-friendly.

- Backend design using Python Flask for handling requests and responses.
- Planning of the dataset integration with AI/ML libraries for accurate predictions.

3. Implementation (Coding)

- Once the design was ready, the system was implemented step by step.
- Key tasks in this phase included:
  - Building the frontend web pages such as Home, About, How It Works, and Contact.
  - Implementing the image upload and preview feature.
  - Coding the backend in Flask to process inputs and communicate with the AI/ML model.
  - Integrating the dataset to train and test predictions.
- At this stage, the actual system started to take shape.

4. Testing

- In this phase, the system was carefully tested to ensure correctness and usability.
- The testing process focused on:
  - Checking whether image upload and drag-drop functions work properly.
  - Verifying if predictions are displayed correctly.
  - Testing error handling, such as alerts when no image or symptoms are provided.
  - Ensuring remedies and suggestions display properly.
- The goal of this phase was to make the system reliable and bug-free.

5. Deployment

- After successful testing, the project was deployed locally through the Flask server.
- The user can now access the system by running it on their machine and interact with its features in real-time.
- This phase made the project ready for demonstration and academic evaluation.

6. Maintenance

- Maintenance involves making improvements and fixing any issues that arise after deployment.
- For DermaScan AI, the future scope of maintenance includes:
  - Expanding the dataset with more images and symptoms to improve accuracy.
  - Updating the remedies and advice section based on verified sources.

## 3.2 System Analysis

1. Existing System

- At present, most people either ignore minor skin problems or try to handle them by looking up solutions online. This often results in confusion because different websites and sources provide contradictory remedies, leaving the person uncertain about what to follow.
- Visiting a dermatologist for every small skin concern is not practical because it requires time, effort, and money. People hesitate to book appointments unless the condition worsens, which may lead to delays in treatment.
- There is currently no integrated tool that allows users to upload an image of their skin issue, describe their symptoms, and get a guided analysis all in one place.

2. Proposed System

- Our system introduces an AI-powered skin concern prediction tool where the user can upload a skin image, provide symptom details, and select the duration of the issue. Based on this data, the system uses machine learning to suggest possible conditions.
- Along with predictions, the system also provides general self-care recommendations. This makes it a supportive tool for awareness and early action, without replacing professional medical advice.
- The goal of the system is to act as a first-level guide so that users can make informed decisions and consult a doctor if necessary, rather than relying solely on unverified internet searches.

## 3.3 Use Case Diagram

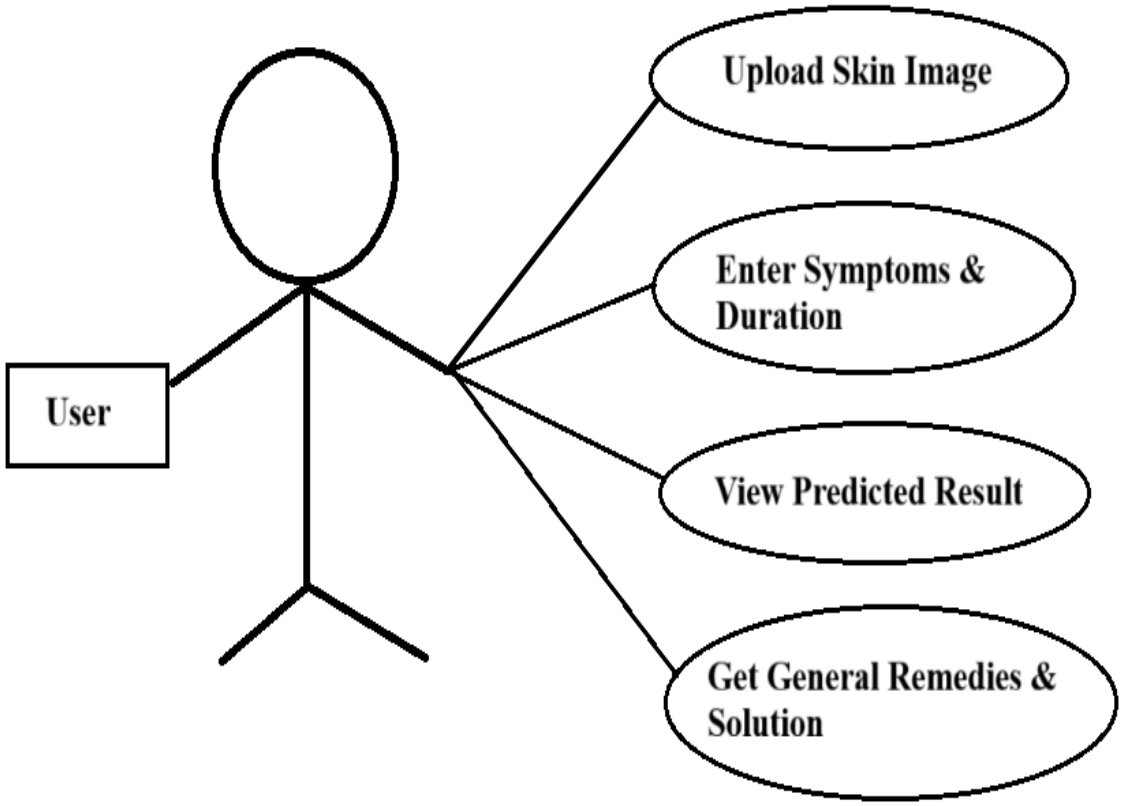


Figure 3.3.1

## 3.4 Context Flow Diagram

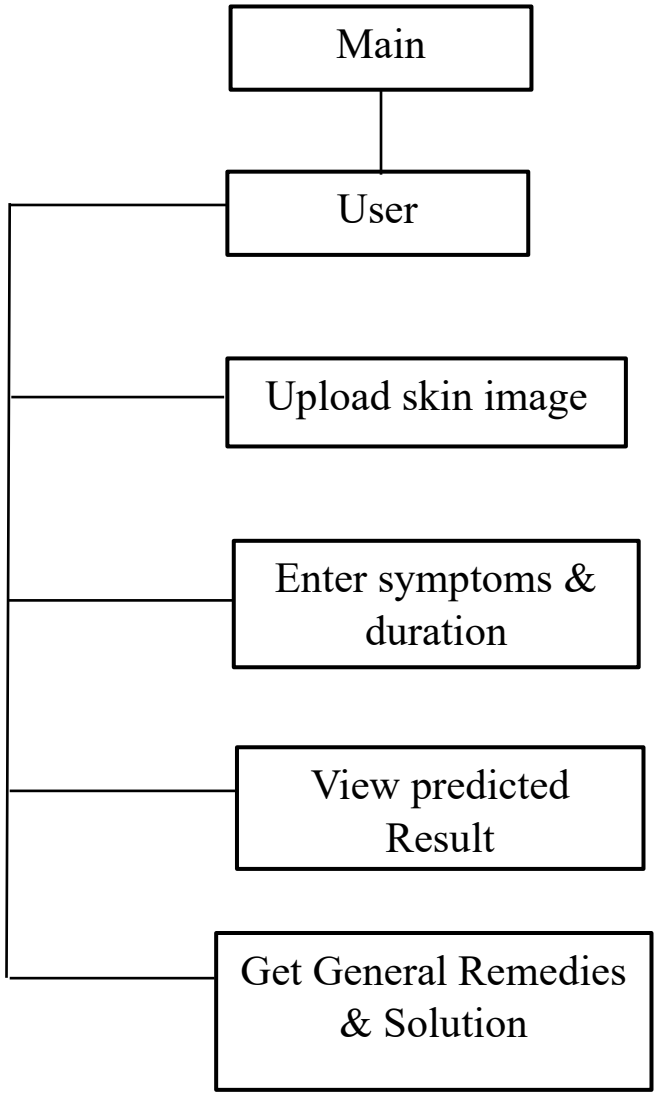


Figure 3.4.1

## 3.5 Data Flow Diagram (DFD)

- Level-0 DFD

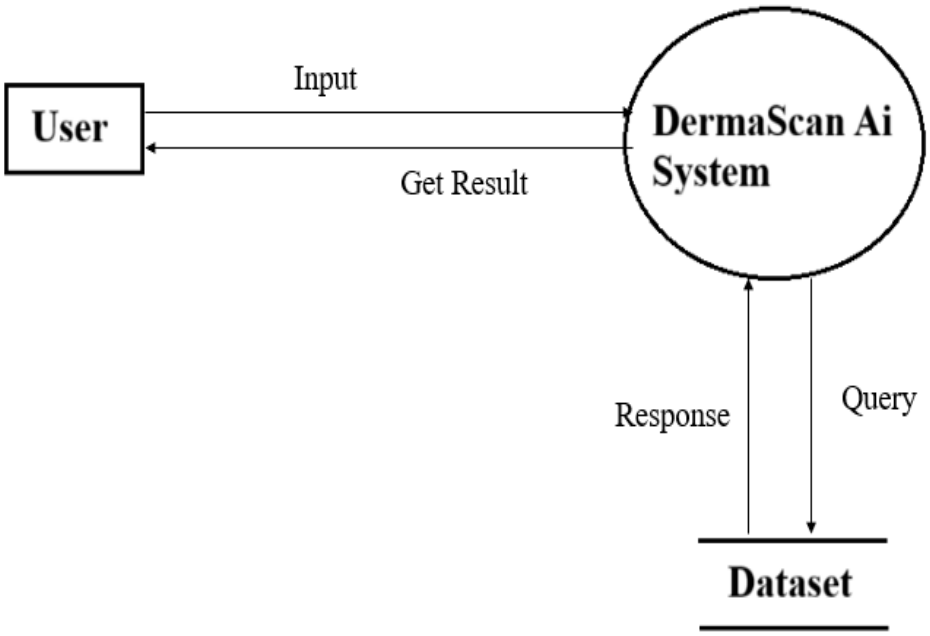


Figure 3.5.1

The Level-0 DFD represents the overall flow of the DermaScan AI System at a very high level.

- The User interacts with the system by providing input such as an image of the skin condition, symptoms, and duration.
- The DermaScan AI System processes this input and generates predictions using its machine learning model.
- To make predictions, the system queries the Dataset that contains labeled skin images and related information.
- The Dataset responds back to the system with relevant data patterns.
- Finally, the DermaScan AI System provides the Result back to the user in the form of predicted skin concerns along with general care suggestions.

- Level-1 DFD

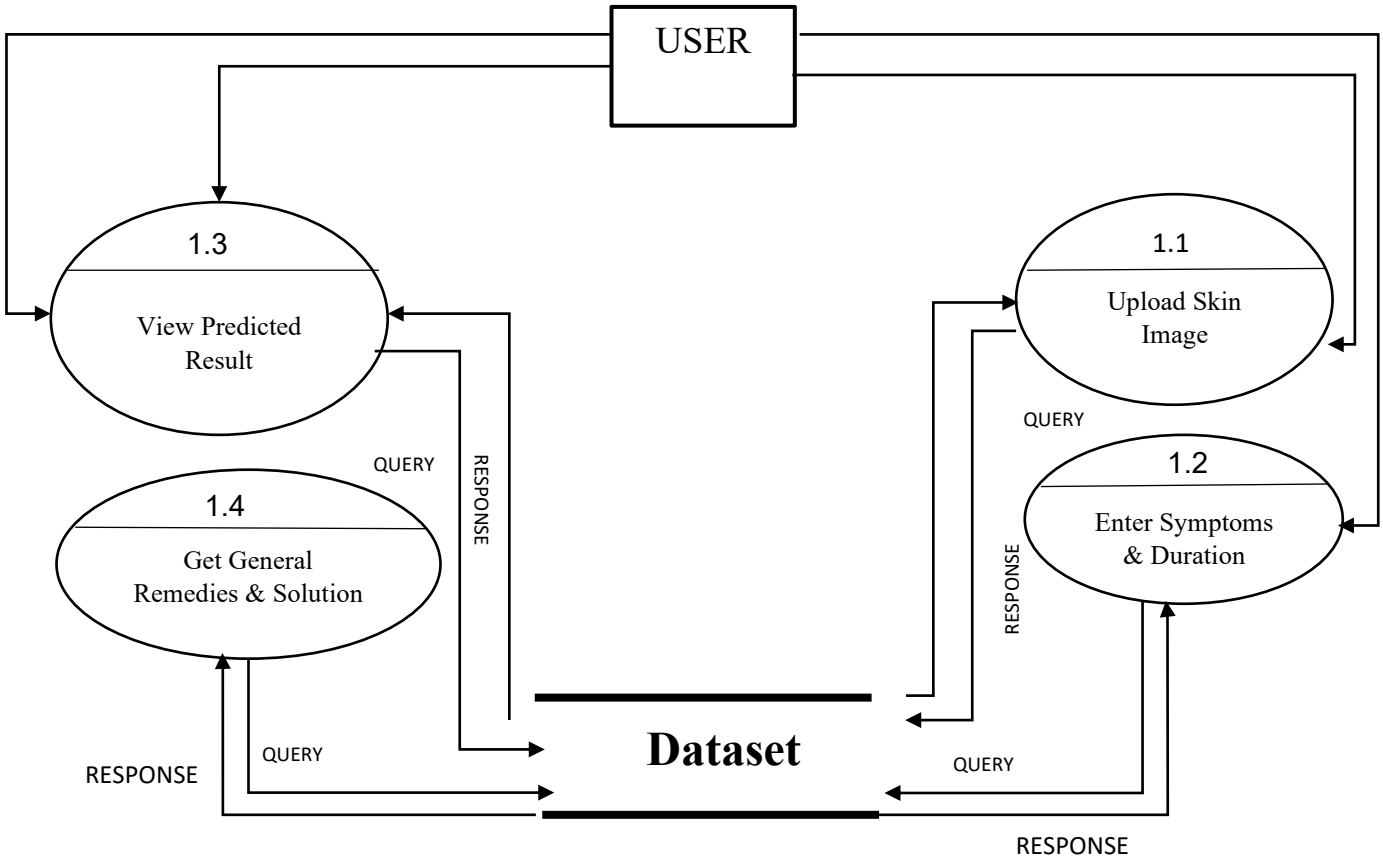


Figure 3.5.2

The Level-1 DFD provides a more detailed breakdown of the processes within the **DermaScan AI System**.

1. **Upload Skin Image**
    - The user begins by uploading an image of their skin problem.
    - The system queries the dataset to compare the uploaded image with existing records.
2. **Enter Symptoms & Duration**
    - The user provides additional input such as visible symptoms and the duration of the issue.
    - This information is matched with dataset patterns to refine prediction accuracy.
3. **View Predicted Result**
    - Based on the combined analysis of image and symptoms, the system generates a predicted result.
    - The user can view the condition prediction with a confidence percentage.

4. **Get General Remedies & Solution**

    - Along with prediction, the system provides general remedies and solutions for common skin issues.
    - These suggestions are fetched from the dataset and displayed to the user in an easy-to-understand format.

In this way, the Level-1 DFD explains the detailed interaction between the **user**, the **system**, and the dataset, ensuring that both image and symptom data contribute to a reliable prediction and useful general advice.

## 3.6 System Requirement Specification

The system requirements for the "DermaScan AI" project are categorized into hardware, software and functional requirements. These requirements ensure smooth development, testing, and deployment of the website.

### 3.6.1 Hardware Requirements

| **Hardware specification** | **Minimum** | **Used** |
|---|---|---|
| Processor | Intel Core i3 | Intel Core i5 |
| RAM | 8GB | 16GB |
| Hard Disk Space | 128GB | 512GB |

### 3.6.2 Software Requirement

| S.No. | Requirements | Description |
|---|---|---|
| 1. | Frontend Language | The website is built using HTML, CSS, and JavaScript for structure, styling, and interactivity |
| 1. | Backend Language | Python is used for backend. Ai/ml libraries , flask ,etc is used to built website logic. |
| 2. | Development Tools | Code editor(Visual Studio Code) , Jupyter |
| 3. | Operating System | Windows 11 |
| 5. | Reporting Software | Ms-Word |

# 4 System Design

## 4.1 User Interface Design

The interface is designed to be simple, user-friendly, and responsive, ensuring smooth interaction for users. Key elements include:

- **Home Page:**
  - Provides the main functionality where users can upload an image of their skin condition, select symptoms, and specify the duration of the problem.
  - Once submitted, the system predicts the possible skin concern and displays confidence level along with general remedies.

- **How It Works Page:**
  - Offers a clear explanation of how the AI/ML model processes inputs (image, symptoms, and duration).
  - Helps users understand the step-by-step process behind the prediction in simple terms.

- **About Page:**
  - Gives an overview of the project's purpose, background, and objectives.
  - Highlights the importance of addressing skin concerns early and how this project serves as an educational tool.

- **Contact Page:**
  - Provides contact details for users to reach out.
  - Includes a note/disclaimer emphasizing that the tool is for educational purposes only and not a substitute for professional medical advice.

## 4.2 Functional Modules

1. **Home Page Module:**
    - Allows users to upload an image of their skin concern.
    - Provides options to select symptoms (via checkboxes) and duration (via dropdown).
    - On submission, the system predicts the possible skin concern and displays:
        - Condition name
        - General remedies and suggestions

2. **How It Works Module:**
    - Explains the step-by-step working of the AI/ML model in simple and user-friendly terms.
    - Helps users understand how their uploaded data (image + symptoms + duration) is processed.

3. **About Module:**
    - Offers background of the project and its purpose.
    - Explains the problem statement (why people ignore small skin issues and get confused online).
    - States the objective of the project as an educational and awareness tool.

4. **Contact Module:**
    - Displays contact details such as address, email, and phone number.
    - Includes a disclaimer clarifying that this tool is only for educational purposes and not a replacement for medical advice.

## 4.3 System Architecture

1. Frontend:

- Built using HTML, CSS, and JavaScript for a responsive, dynamic, and user-friendly interface.
- Includes lightweight form validation scripts to ensure accurate input from users.

2. Backend:

- Implemented usingAi/Ml libraries Python Flask to handle user inputs (image, symptoms, duration) and communicate with the AI/ML model.
- Uses a skin dataset for predictions and returns results with confidence and remedies.
- Future scope: expand dataset, integrate cloud for scalability, and add user data storage.

## 4.4 Module Drscription

| Feature | Description |
|---|---|
| Image Upload | Users can upload an image of their skin concern for AI-based analysis. |
| Symptom & Duration Input | Users can select related symptoms and specify the duration of the issue for more accurate predictions. |
| Skin Concern Prediction | The system analyzes the uploaded data and provides possible skin concern prediction. |
| General Remedies | Along with predictions, the system suggests general remedies or self-care practices for awareness. |
| How It Works Section | Explains in simple terms how the AI model processes inputs (image, symptoms, duration) to generate predictions. |
| About Section | Provides background about the project, problem statement, and its objective of raising awareness. |
| Contact Section | Displays address, email, and phone number for queries. Includes a disclaimer that the tool is for educational purposes only. |

# 5.User Interface

- Home Page(Landing Page)

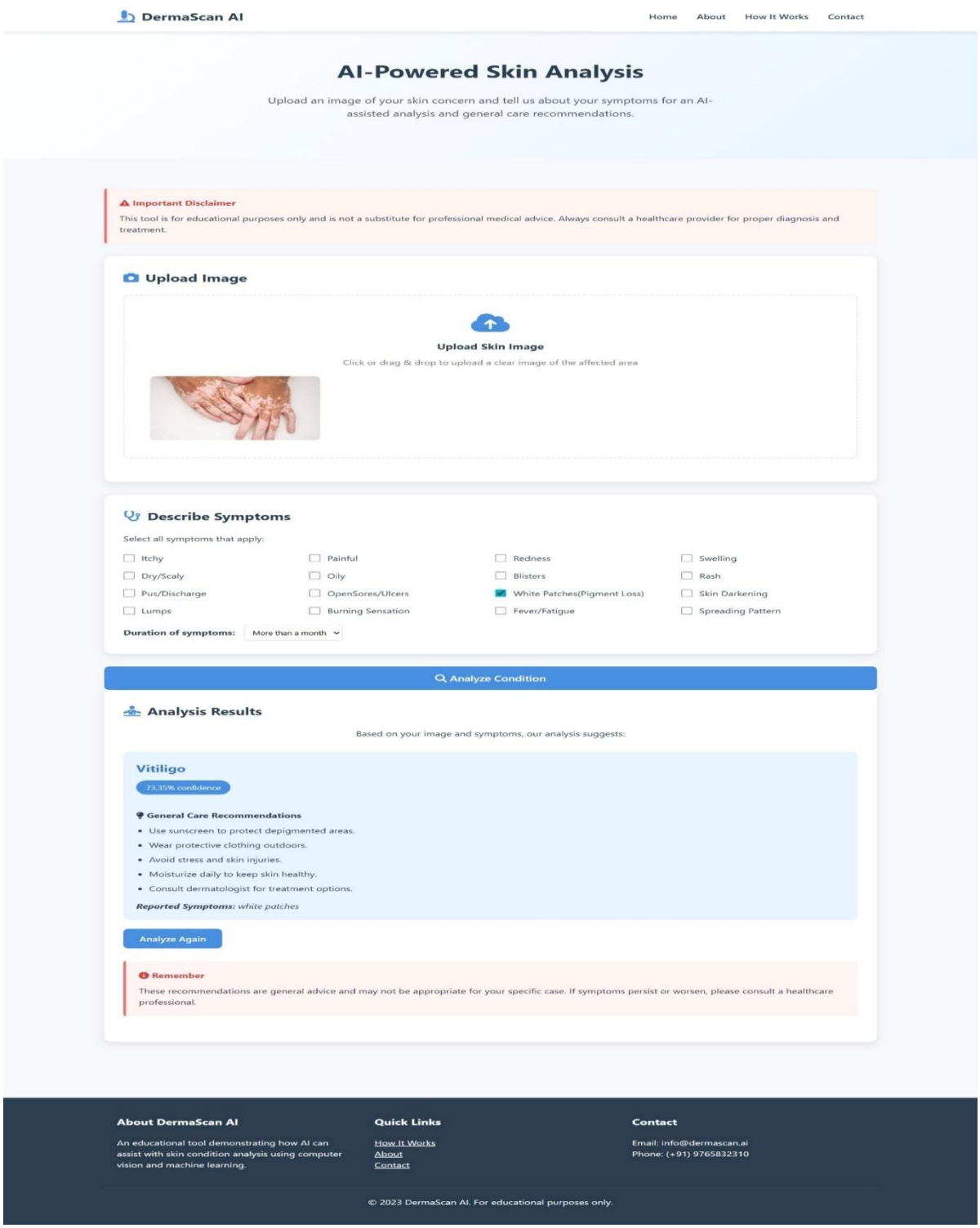


Figure 5.1

- How it works Page

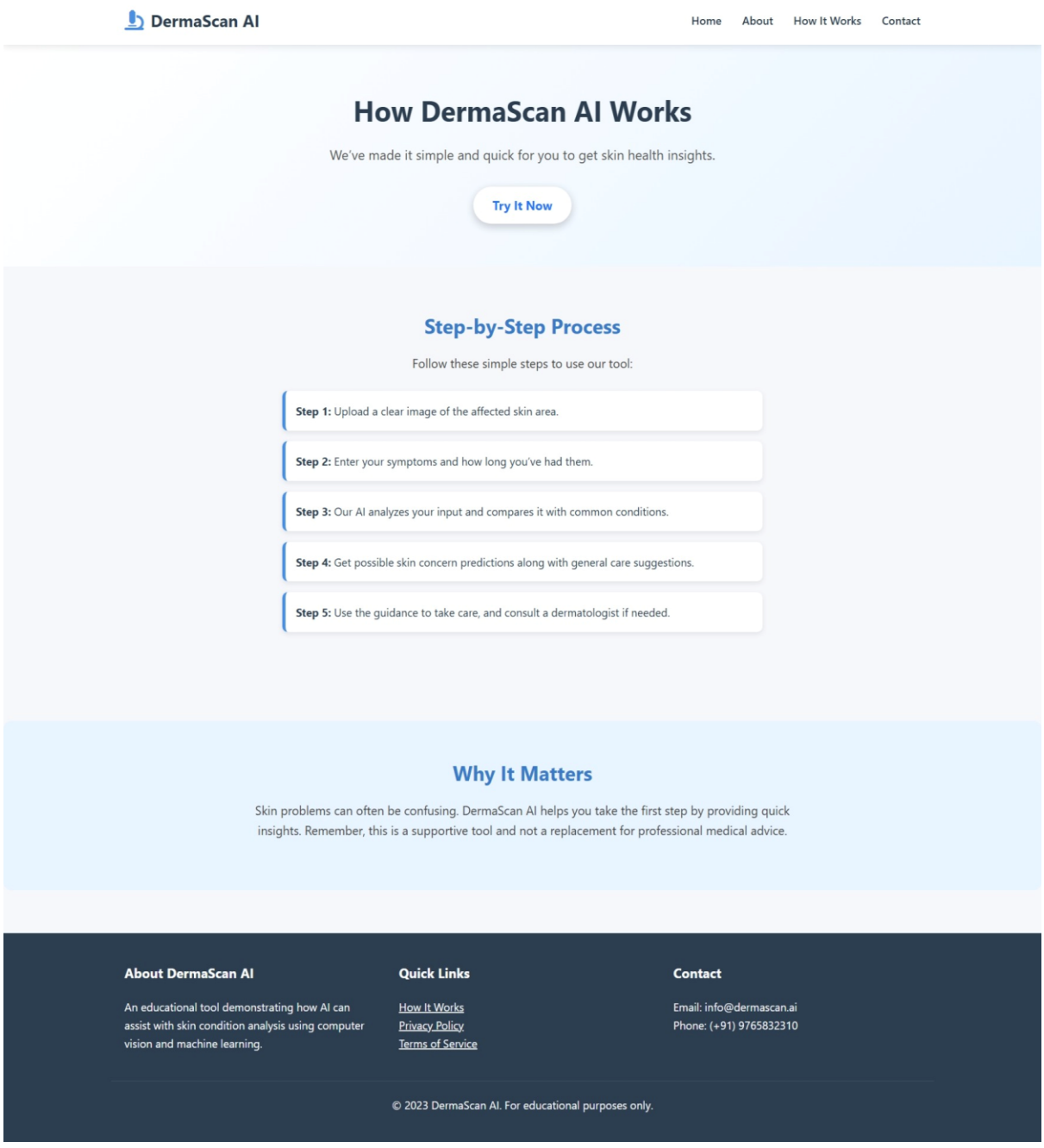


Figure 5.2

- About Page

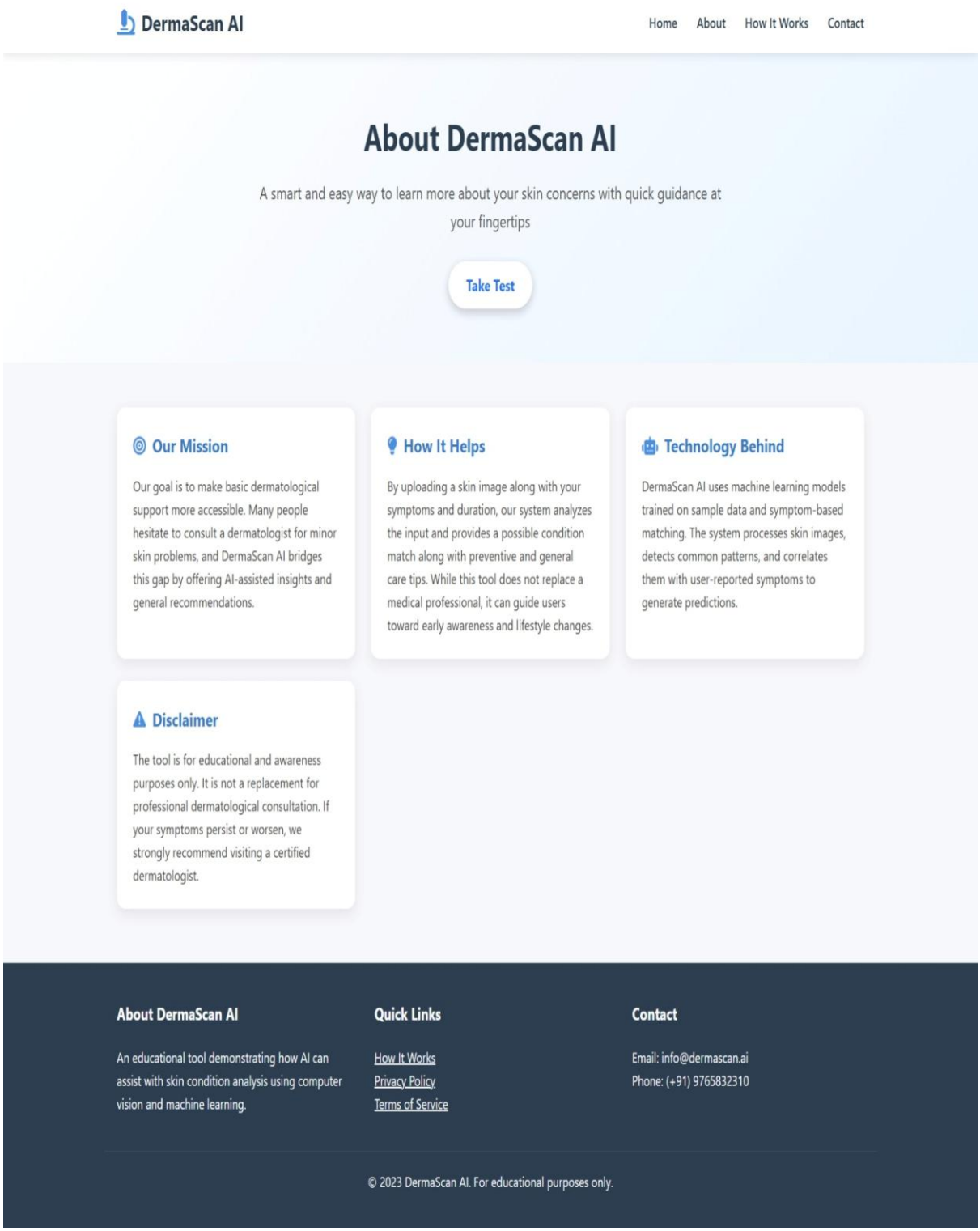


Figure 5.3

- Contact Page

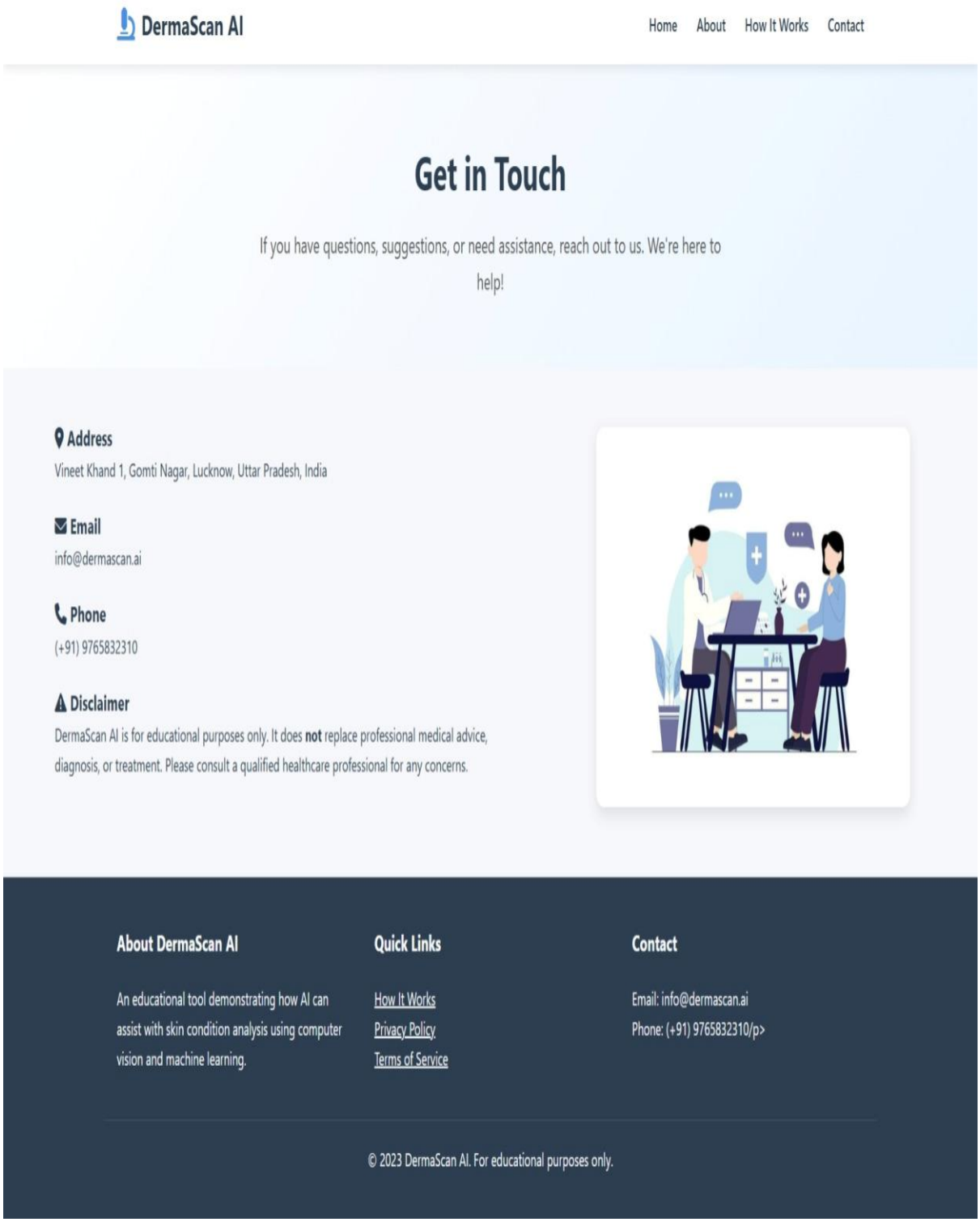


Figure 5.4

# 6. Coding

- Home Page (Index.html)

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>DermaScan AI - Skin Analysis Tool</title>
  <linkrel="stylesheet"href="https://cdnjs.cloudflare.com/ajax/libs/font-
awesome/6.4.0/css/all.min.css">
  <link rel="stylesheet" href="{{ url_for('static', filename='style.css') }}">
</head>
<body>
  <header>
    <div class="container header-content">
      <div class="logo">
        <i class="fas fa-microscope"></i>
        <h1>DermaScan AI</h1>
      </div>
      <nav>
        <ul>
          <li><a href="{{ url_for('index') }}">Home</a></li>
          <li><a href="{{ url_for('about') }}">About</a></li>
          <li><a href="{{ url_for('work') }}">How It Works</a></li>
          <li><a href="{{ url_for('contact') }}">Contact</a></li>
        </ul>
      </nav>
    </div>
  </header>
  <section class="hero">
    <div class="container">
      <h2>AI-Powered Skin Analysis</h2>
      <p>Upload an image of your skin concern and tell us about your symptoms for an
AI-assisted analysis and general care recommendations.</p>
    </div>
  </section>
  <main class="container main-content">
    <div class="disclaimer">
      <h4><i class="fas fa-exclamation-triangle"></i> Important Disclaimer</h4>
      <p>This tool is for educational purposes only and is not a substitute for professional
medical advice. Always consult a healthcare provider for proper diagnosis and
treatment.</p>
    </div>
    <div class="card">
      <h2 class="card-title"><i class="fas fa-camera"></i> Upload Image</h2>
      <div class="upload-area" id="upload-area">
        <i class="fas fa-cloud-upload-alt"></i>
```

```
            <h3>Upload Skin Image</h3>
            <p>Click or drag & drop to upload a clear image of the affected area</p>
            <img id="image-preview" alt="Image preview">
          </div>
          <input type="file" id="image-upload" accept="image/*" hidden>
        </div>
        <div class="card">
          <h2 class="card-title"><i class="fas fa-stethoscope"></i> Describe
Symptoms</h2>
          <p>Select all symptoms that apply:</p>
          <div class="symptoms-checklist">
            <div class="symptom-item">
              <input type="checkbox" id="itchy" name="symptoms" value="itchy">
              <label for="itchy">Itchy</label>
            </div>
            <div class="symptom-item">
              <input type="checkbox" id="painful" name="symptoms" value="painful">
              <label for="painful">Painful</label>
            </div>
            <div class="symptom-item">
              <input type="checkbox" id="redness" name="symptoms" value="redness">
              <label for="redness">Redness</label>
            </div>
            <div class="symptom-item">
              <inputtype="checkbox" id="swelling" name="symptoms" value="Swelling">
              <label for="swelling">Swelling</label>
            </div>
            <div class="symptom-item">
              <input type="checkbox" id="dry" name="symptoms"value="dry/Scaly">
              <label for="dry">Dry/Scaly</label>
            </div>
            <div class="symptom-item">
              <input type="checkbox" id="oily" name="symptoms" value="oily">
              <label for="oily">Oily</label>
            </div>
            <div class="symptom-item">
              <input type="checkbox" id="blisters" name="symptoms" value="blisters">
              <label for="blisters">Blisters</label>
            </div>
            <div class="symptom-item">
              <input type="checkbox" id="rash" name="symptoms" value="rash">
              <label for="rash">Rash</label>
            </div>
            <div class="symptom-item">
            <input type="checkbox" id="pus" name="symptoms" value="pus/discharge">
            <label for="pus">Pus/Discharge</label>
          </div>
          <div class="symptom-item">
```

```
            <input type="checkbox" id="ulcer" name="symptoms" value="open sores">
            <label for="ulcer">OpenSores/Ulcers</label>
          </div>
          <div class="symptom-item">
            <input type="checkbox" id="white-patches" name="symptoms" value="white
patches">
            <label for="white-patches">White Patches(Pigment Loss)</label>
          </div>
          <div class="symptom-item">
            <inputtype="checkbox"id="darkening"name="symptoms"value="skin
darkening">
            <label for="darkening">Skin Darkening</label>
          </div>
          <div class="symptom-item">
            <inputtype="checkbox"id="lumps"name="symptoms" value="lumps/nodules">
            <label for="lumps">Lumps</label>
          </div>
          <div class="symptom-item">
            <input type="checkbox" id="burning" name="symptoms" value="burning">
            <label for="burning">Burning Sensation</label>
          </div>
          <div class="symptom-item">
            <input type="checkbox" id="fever" name="symptoms" value="fever/fatigue">
            <label for="fever">Fever/Fatigue</label>
          </div>
          <div class="symptom-item">
            <input type="checkbox" id="spreading" name="symptoms" value="spreading">
            <label for="spreading">Spreading Pattern</label>
          </div>
          </div>
          <div style="margin-top: 20px;">
            <label for="duration"><strong>Duration of symptoms:</strong></label>
            <select id="duration" style="margin-left: 10px; padding: 8px; border-radius:
6px; border: 1px solid #ddd;">
              <option value="">Select duration</option>
              <option value="less-than-week">Less than a week</option>
              <option value="1-2-weeks">1-2 weeks</option>
              <option value="2-4-weeks">2-4 weeks</option>
              <option value="more-than-month">More than a month</option>
            </select>
          </div>
        </div>
        <button class="btn btn-large btn-block" id="analyze-btn">
          <i class="fas fa-search"></i> Analyze Condition
        </button>

        <div class="card results-area" id="results-area" style="display:none;">
      <div class="result-header">
```

```
        <h2 class="card-title"><i class="fas fa-diagnoses"></i> Analysis Results</h2>
        <p>Based on your image and symptoms, our analysis suggests:</p>
      </div>
      <div class="condition-card">
        <h3 class="condition-name" id="result-condition">Condition will appear here</h3>
        <span class="confidence" id="result-confidence"></span>
        <p id="result-description"></p>
        <div class="recommendations">
          <h4><i class="fas fa-lightbulb"></i> General Care Recommendations</h4>
          <ul id="recommendations-list">
            <!-- Recommendations will be added by JS -->
          </ul>
        </div>
      </div>
      <button class="btn1" onclick="refreshPage()" >
        Analyze Again
      </button>
      <div class="disclaimer">
        <h4><i class="fas fa-info-circle"></i> Remember</h4>
        <p>These recommendations are general advice and may not be appropriate for your specific case. If symptoms persist or worsen, please consult a healthcare professional.</p>
      </div>
    </div>
    </main>
    <footer>
      <div class="container footer-content">
        <div class="footer-section">
          <h3>About DermaScan AI</h3>
          <p>An educational tool demonstrating how AI can assist with skin condition analysis using computer vision and machine learning.</p>
        </div>
        <div class="footer-section">
          <h3>Quick Links</h3>
          <ul style="list-style: none;">
            <li><a href="#" style="color: #fff;">How It Works</a></li>
            <li><a href="#" style="color: #fff;">Privacy Policy</a></li>
            <li><a href="#" style="color: #fff;">Terms of Service</a></li>
          </ul>
        </div>
        <div class="footer-section">
          <h3>Contact</h3>
          <p>Email: info@dermascan.ai</p>
          <p>Phone: (+91) 9765832310</p>
        </div>
      </div>
      <div class="container footer-bottom">
        <p>&copy; 2023 DermaScan AI. For educational purposes only.</p>
      </div>
```

```
    </footer>
    <script>
const uploadArea = document.getElementById('upload-area');
const imageUpload = document.getElementById('image-upload');
const imagePreview = document.getElementById('image-preview');
const analyzeBtn = document.getElementById('analyze-btn');
const resultsArea = document.getElementById('results-area');
uploadArea.addEventListener('click', () => {
    imageUpload.click();  // Opens file picker
});
imageUpload.addEventListener('change', () => {
    const file = imageUpload.files[0];
    if (file) {
        const reader = new FileReader();
        reader.onload = function(e) {
            imagePreview.src = e.target.result;
            imagePreview.style.display = 'block';
        };
        reader.readAsDataURL(file);
    }
});
analyzeBtn.addEventListener('click', async () => {
    const selectedSymptoms = [];
    document.querySelectorAll('input[name="symptoms"]:checked').forEach(cb=>
selectedSymptoms.push(cb.value));
    const duration = document.getElementById('duration').value;
    if (!imageUpload.files[0] || selectedSymptoms.length === 0 || !duration) {
        alert('Please fill all fields first!');
        return;
    }
    analyzeBtn.innerHTML = '<i class="fas fa-spinner fa-spin"></i> Analyzing...';
    analyzeBtn.disabled = true;
    try {
        const formData = new FormData();
        formData.append('image', imageUpload.files[0]);
        selectedSymptoms.forEach(symptom => formData.append('symptoms', symptom));
        formData.append('duration', duration);
        const response = await fetch('/analyze', { method: 'POST', body: formData });
        const result = await response.json();
        if (result.success) {
            displayResults(result);
            resultsArea.style.display = 'block';
            resultsArea.scrollIntoView({ behavior: 'smooth' });
        } else {
            alert('Error: ' + result.error);
        }
    } catch (error) {
        console.error('Error:', error);
```

```
        alert('Error analyzing image. Please try again.');
    } finally {
        analyzeBtn.innerHTML = '<i class="fas fa-search"></i> Analyze Condition';
        analyzeBtn.disabled = false;
    }
});
function displayResults(result) {
    document.getElementById('result-condition').textContent = result.condition;
    document.getElementById('result-confidence').textContent = result.confidence + '% confidence';
    document.getElementById('result-description').textContent = result.description || '';
    const recommendationsList = document.getElementById('recommendations-list');
    recommendationsList.innerHTML = '';
    if (result.recommendations && result.recommendations.length > 0) {
        result.recommendations.forEach(rec => {
            const li = document.createElement('li');
            li.textContent = rec;
            recommendationsList.appendChild(li);
        });
    } else {
        const li = document.createElement('li');
        li.textContent = "No specific recommendations available.";
        recommendationsList.appendChild(li);
    }
    if (result.symptoms && result.symptoms.length > 0) {
        const symptomsElement = document.createElement('p');
        symptomsElement.innerHTML = `<strong>Reported Symptoms:</strong> ${result.symptoms.join(', ')}`;
        symptomsElement.style.marginTop = '15px';
        symptomsElement.style.fontStyle = 'italic';
        recommendationsList.parentNode.insertBefore(symptomsElement, recommendationsList.nextSibling);
    }
}
function refreshPage() {
    window.location.reload(); // This will reload the current page
}
    </script>
</body>
</html>
```

- Style Page (style.css)

```
* {
    margin: 0;
    padding: 0;
    box-sizing: border-box;
    font-family: 'Segoe UI', Tahoma, Geneva, Verdana, sans-serif;
}
:root {
    --primary-blue: #4A90E2;
    --light-blue: #E8F4FF;
    --dark-blue: #3A7BC8;
    --white: #FFFFFF;
    --black: #2C3E50;
    --light-gray: #F5F7FA;
    --gray: #E2E8F0;
    --accent: #6C63FF;
}
body {
    background-color: var(--light-gray);
    color: var(--black);
    line-height: 1.6;
}
.container {
    max-width: 1200px;
    margin: 0 auto;
    padding: 0 20px;
}
header {
    background: var(--white);
    box-shadow: 0 2px 10px rgba(0, 0, 0, 0.1);
    padding: 15px 0;
    position: sticky;
    top: 0;
    z-index: 100;
}
.header-content {
    display: flex;
    justify-content: space-between;
    align-items: center;
}
.logo {
    display: flex;
    align-items: center;
    gap: 10px;
}
.logo i {
    color: var(--primary-blue);
```

```
    font-size: 28px;
}
.logo h1 {
    font-size: 24px;
    font-weight: 700;
    color: var(--black);
}
nav ul {
    display: flex;
    list-style: none;
    gap: 30px;
}
nav a {
    text-decoration: none;
    color: var(--black);
    font-weight: 500;
    transition: color 0.3s;
}
nav a:hover {
    color: var(--primary-blue);
}
.hero {
    padding: 60px 0;
    text-align: center;
    background: linear-gradient(135deg, var(--white) 0%, var(--light-blue) 100%);
}
.hero h2 {
    font-size: 2.5rem;
    margin-bottom: 20px;
    color: var(--black);
}
.hero p {
    font-size: 1.2rem;
    max-width: 700px;
    margin: 0 auto 30px;
    color: #555;
}
.main-content {
    padding: 40px 0;
}
.card {
    background: var(--white);
    border-radius: 12px;
    box-shadow: 0 5px 15px rgba(0, 0, 0, 0.08);
    padding: 30px;
    margin-bottom: 30px;
}
.card-title {
```

```
    font-size: 1.5rem;
    margin-bottom: 20px;
    color: var(--black);
    display: flex;
    align-items: center;
    gap: 10px;
}
.card-title i {
    color: var(--primary-blue);
}
.upload-area {
    border: 2px dashed var(--gray);
    border-radius: 10px;
    padding: 40px;
    text-align: center;
    margin-bottom: 25px;
    transition: all 0.3s;
    cursor: pointer;
}
.upload-area:hover {
    border-color: var(--primary-blue);
    background: var(--light-blue);
}
.upload-area i {
    font-size: 48px;
    color: var(--primary-blue);
    margin-bottom: 15px;
}
.upload-area h3 {
    margin-bottom: 10px;
}
.upload-area p {
    color: #777;
}
#image-preview {
    max-width: 100%;
    max-height: 300px;
    margin-top: 20px;
    border-radius: 8px;
    display: none;
}
.symptoms-checklist {
    display: grid;
    grid-template-columns: repeat(auto-fill, minmax(250px, 1fr));
    gap: 15px;
    margin: 20px 0;
}
.symptom-item {
```

```
    display: flex;
    align-items: center;
    gap: 10px;
}
.symptom-item input {
    width: 18px;
    height: 18px;
}
.btn {
    background: var(--primary-blue);
    color: white;
    border: none;
    padding: 12px 25px;
    border-radius: 8px;
    font-size: 16px;
    font-weight: 600;
    cursor: pointer;
    transition: background 0.3s;
    display: inline-flex;
    align-items: center;
    gap: 8px;
}
.btn:hover {
    background: var(--dark-blue);
}
.btn-large {
    padding: 15px 30px;
    font-size: 18px;
}
.btn-block {
    display: block;
    width: 100%;
    justify-content: center;
}
.results-area {
    display: none;
}
.result-header {
    text-align: center;
    margin-bottom: 30px;
}
.condition-card {
    background: var(--light-blue);
    border-radius: 10px;
    padding: 20px;
    margin-bottom: 20px;
}
.condition-name {
```

```
    font-size: 1.4rem;
    color: var(--dark-blue);
    margin-bottom: 10px;
}
.confidence {
    display: inline-block;
    background: var(--primary-blue);
    color: white;
    padding: 5px 15px;
    border-radius: 20px;
    font-size: 14px;
    margin-bottom: 15px;
}
.recommendations {
    margin-top: 20px;
}
.recommendations h4 {
    margin-bottom: 10px;
    color: var(--black);
}
.recommendations ul {
    padding-left: 20px;
}
.recommendations li {
    margin-bottom: 8px;
}
 .btn1{
     background: var(--primary-blue);
    color: white;
    border: none;
    padding: 12px 25px;
    border-radius: 8px;
    font-size: 16px;
    font-weight: 600;
    cursor: pointer;
    transition: background 0.3s;
    display: inline-flex;
    align-items: center;
    gap: 8px;
 }

.btn1:hover{
    background: var(--dark-blue);
}
.disclaimer {
    background: #FFF4F4;
    border-left: 4px solid #FF6B6B;
    padding: 20px;
```

```
    margin: 30px 0;
    border-radius: 4px;
}
.disclaimer h4 {
    color: #D64545;
    margin-bottom: 10px;
}
footer {
    background: var(--black);
    color: white;
    padding: 40px 0;
    margin-top: 60px;
}
.footer-content {
    display: flex;
    justify-content: space-between;
    flex-wrap: wrap;
    gap: 40px;
}
.footer-section {
    flex: 1;
    min-width: 250px;
}
.footer-section h3 {
    margin-bottom: 20px;
    font-size: 1.2rem;
}
.footer-bottom {
    text-align: center;
    margin-top: 40px;
    padding-top: 20px;
    border-top: 1px solid rgba(255, 255, 255, 0.1);
}
@media (max-width: 768px) {
    .header-content {
        flex-direction: column;
        gap: 15px;
    }
    nav ul {
        gap: 15px;
    }
    .hero h2 {
        font-size: 2rem;
    }
    .card {
        padding: 20px;
    }
}
```

- About page (About.html)

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>DermaScan AI - Skin Analysis Tool</title>
  <linkrel="stylesheet"href="https://cdnjs.cloudflare.com/ajax/libs/font-
awesome/6.4.0/css/all.min.css">
  <link rel="stylesheet" href="{{ url_for('static', filename='style1.css') }}">
</head>
<body>
  <header>
    <div class="container header-content">
      <div class="logo">
        <i class="fas fa-microscope"></i>
        <h1>DermaScan AI</h1>
      </div>
      <nav>
        <ul>
          <li><a href="{{ url_for('index') }}">Home</a></li>
          <li><a href="{{ url_for('about') }}">About</a></li>
          <li><a href="{{ url_for('work') }}">How It Works</a></li>
          <li><a href="{{ url_for('contact') }}">Contact</a></li>
        </ul>
      </nav>
    </div>
  </header>
  <section class="about-hero">
    <div class="container">
      <h2>About DermaScan AI</h2>
      <p>A smart and easy way to learn more about your skin concerns with quick
guidance at your fingertips</p>
      <a href="index.html" class="btn">Take Test</a>
    </div>
  </section>
  <section class="about-content container">
    <div class="about-box">
      <h3><i class="fas fa-bullseye"></i> Our Mission</h3>
      <p>Our goal is to make basic dermatological support more accessible. Many people
hesitate to consult a dermatologist for minor skin problems, and DermaScan AI bridges this
gap by offering AI-assisted insights and general recommendations.</p>
    </div>
    <div class="about-box">
      <h3><i class="fas fa-lightbulb"></i> How It Helps</h3>
      <p>By uploading a skin image along with your symptoms and duration, our system
analyzes the input and provides a possible condition match along with preventive and
```

```
general care tips. While this tool does not replace a medical professional, it can guide users toward early awareness and lifestyle changes.</p>
      </div>
      <div class="about-box">
        <h3><i class="fas fa-robot"></i> Technology Behind</h3>
        <p>DermaScan AI uses machine learning models trained on sample data and symptom-based matching. The system processes skin images, detects common patterns, and correlates them with user-reported symptoms to generate predictions.</p>
      </div>
      <div class="about-box">
        <h3><i class="fas fa-exclamation-triangle"></i> Disclaimer</h3>
        <p>The tool is for educational and awareness purposes only. It is not a replacement for professional dermatological consultation. If your symptoms persist or worsen, we strongly recommend visiting a certified dermatologist.</p>
      </div>
    </section>
    <footer>
      <div class="container footer-content">
        <div class="footer-section">
          <h3>About DermaScan AI</h3>
          <p>An educational tool demonstrating how AI can assist with skin condition analysis using computer vision and machine learning.</p>
        </div>
        <div class="footer-section">
          <h3>Quick Links</h3>
          <ul style="list-style: none;">
            <li><a href="#" style="color: #fff;">How It Works</a></li>
            <li><a href="#" style="color: #fff;">Privacy Policy</a></li>
            <li><a href="#" style="color: #fff;">Terms of Service</a></li>
          </ul>
        </div>
        <div class="footer-section">
          <h3>Contact</h3>
          <p>Email: info@dermascan.ai</p>
          <p>Phone: (+91) 9765832310</p>
        </div>
      </div>
      <div class="container footer-bottom">
        <p>&copy; 2023 DermaScan AI. For educational purposes only.</p>
      </div>
    </footer>
</body>
</html>
```

- How It Work Page(work.html)

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>How It Works - DermaScan AI</title>
  <linkrel="stylesheet"href="https://cdnjs.cloudflare.com/ajax/libs/font-
awesome/6.4.0/css/all.min.css">
  <link rel="stylesheet" href="{{ url_for('static', filename='style2.css') }}">
</head>
<body>
  <!-- Header -->
  <header>
    <div class="container header-content">
      <div class="logo">
        <i class="fas fa-microscope"></i>
        <h1>DermaScan AI</h1>
      </div>
      <nav>
        <ul>
          <li><a href="{{ url_for('index') }}">Home</a></li>
          <li><a href="{{ url_for('about') }}">About</a></li>
          <li><a href="{{ url_for('work') }}">How It Works</a></li>
          <li><a href="{{ url_for('contact') }}">Contact</a></li>
        </ul>
      </nav>
    </div>
  </header>
  <!-- Hero Section -->
  <section class="about-hero">
    <div class="container">
      <h2>How DermaScan AI Works</h2>
      <p>We've made it simple and quick for you to get skin health insights.</p>
      <a href="index.html" class="btn">Try It Now</a>
    </div>
  </section>
  <!-- Steps Section -->
  <section class="about-section">
    <div class="container">
      <h3>Step-by-Step Process</h3>
      <p>Follow these simple steps to use our tool:</p>
      <ul>
        <li><strong>Step 1:</strong> Upload a clear image of the affected skin
varea.</li>
        <li><strong>Step 2:</strong> Enter your symptoms and how long you've had
them.</li>
```

```
            <li><strong>Step 3:</strong> Our AI analyzes your input and compares it with common conditions.</li>
            <li><strong>Step 4:</strong> Get possible skin concern predictions along with general care suggestions.</li>
            <li><strong>Step 5:</strong> Use the guidance to take care, and consult a dermatologist if needed.</li>
          </ul>
        </div>
    </section>
    <!-- Info Section -->
    <section class="about-section">
        <div class="container">
            <h3>Why It Matters</h3>
            <p>Skin problems can often be confusing. DermaScan AI helps you take the first step by providing quick insights.
            Remember, this is a supportive tool and not a replacement for professional medical advice.</p>
        </div>
    </section>
    <!-- Footer -->
    <footer>
        <div class="container footer-content">
            <div class="footer-section">
                <h3>About DermaScan AI</h3>
                <p>An educational tool demonstrating how AI can assist with skin condition analysis using computer vision and machine learning.</p>
            </div>
            <div class="footer-section">
                <h3>Quick Links</h3>
                <ul style="list-style: none;">
                    <li><a href="#" style="color: #fff;">How It Works</a></li>
                    <li><a href="#" style="color: #fff;">Privacy Policy</a></li>
                    <li><a href="#" style="color: #fff;">Terms of Service</a></li>
                </ul>
            </div>
            <div class="footer-section">
                <h3>Contact</h3>
                <p>Email: info@dermascan.ai</p>
                <p>Phone: (+91) 9765832310</p>
            </div></div>
        <div class="container footer-bottom">
            <p>&copy; 2023 DermaScan AI. For educational purposes only.</p>
        </div>
    </footer>
</body>
</html>
```

- Contact Page (contact.html)

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>Contact - DermaScan AI</title>
  <linkrel="stylesheet"href="https://cdnjs.cloudflare.com/ajax/libs/font-
awesome/6.4.0/css/all.min.css">
  <link rel="stylesheet" href="{{ url_for('static', filename='style3.css') }}">
</head>
<body>
  <!-- Header -->
  <header>
    <div class="container header-content">
      <div class="logo">
        <i class="fas fa-microscope"></i>
        <h1>DermaScan AI</h1>
      </div>
      <nav>
        <ul>
          <li><a href="{{ url_for('index') }}">Home</a></li>
          <li><a href="{{ url_for('about') }}">About</a></li>
          <li><a href="{{ url_for('work') }}">How It Works</a></li>
          <li><a href="{{ url_for('contact') }}">Contact</a></li>
        </ul>
      </nav>
    </div>
  </header>
  <!-- Hero Section -->
  <section class="about-hero">
    <div class="container">
      <h2>Get in Touch</h2>
      <p>If you have questions, suggestions, or need assistance, reach out to us. We're
here to help!</p>
    </div>
  </section>
  <!-- Contact Details Section -->
  <section class="about-content contact-section">
    <!-- Left: Contact Details -->
    <div class="contact-details">
      <div class="about-box">
        <h3><i class="fas fa-map-marker-alt"></i> Address</h3>
        <p>Vineet Khand 1, Gomti Nagar, Lucknow, Uttar Pradesh, India</p>

      </div>
      <div class="about-box">
```

```
            <h3><i class="fas fa-envelope"></i> Email</h3>
            <p>info@dermascan.ai</p>
          </div>
          <div class="about-box">
            <h3><i class="fas fa-phone"></i> Phone</h3>
            <p>(+91) 9765832310</p>
          </div>
          <div class="about-box">
            <h3><i class="fas fa-exclamation-triangle"></i> Disclaimer</h3>
            <p>DermaScan AI is for educational purposes only. It does <strong>not</strong> replace professional medical advice, diagnosis, or treatment. Please consult a qualified healthcare professional for any concerns.</p>
          </div>
        </div>
        <div class="contact-image">
          <img src="{{ url_for('static', filename='img.jpg') }}" alt="Contact Us">
        </div>
      </section>
      <!-- Footer -->
      <footer>
        <div class="container footer-content">
          <div class="footer-section">
            <h3>About DermaScan AI</h3>
            <p>An educational tool demonstrating how AI can assist with skin condition analysis using computer vision and machine learning.</p>
          </div>
          <div class="footer-section">
            <h3>Quick Links</h3>
            <ul style="list-style: none;">
              <li><a href="#" style="color: #fff;">How It Works</a></li>
              <li><a href="#" style="color: #fff;">Privacy Policy</a></li>
              <li><a href="#" style="color: #fff;">Terms of Service</a></li>
            </ul>
          </div>
          <div class="footer-section">
            <h3>Contact</h3>
            <p>Email: info@dermascan.ai</p>
            <p>Phone: (+91) 9765832310/p>
          </div>
        </div>
        <div class="container footer-bottom">
          <p>&copy; 2023 DermaScan AI. For educational purposes only.</p>
        </div>
      </footer>
    </body>
    </html>
```

- Python code (app.py)

```
from flask import Flask, render_template, request, jsonify
from werkzeug.utils import secure_filename
import os
import numpy as np
from keras.models import load_model
from keras.utils import load_img, img_to_array
from remedies import REMEDIES
# Initialize Flask app
app = Flask(__name__)
MODEL_PATH = os.path.join(os.path.dirname(__file__), "skin_disease_model.h5")
model = load_model(MODEL_PATH)
CLASSES = [
    "Acne",
    "Actinic Keratosis",
    "Benign Tumors",
    "Bullous",
    "Candidiasis",
    "Drug Eruption",
    "Eczema",
    "Infestations/Bites",
    "Lichen",
    "Lupus",
    "Moles",
    "Psoriasis",
    "Rosacea",
    "Seborrheic Keratoses",
    "Skin Cancer",
    "Sun/Sunlight Damage",
    "Tinea",
    "Unknown/Normal",
    "Vascular Tumors",
    "Vasculitis",
    "Vitiligo",
    "Warts"
]
UPLOAD_FOLDER = os.path.join(os.path.dirname(__file__), "uploads")
if not os.path.exists(UPLOAD_FOLDER):
    os.makedirs(UPLOAD_FOLDER)
app.config["UPLOAD_FOLDER"] = UPLOAD_FOLDER
@app.route("/")
def index():
    return render_template("index.html")
@app.route("/about")
def about():
    return render_template("about.html")
@app.route("/work")
```

```
def work():
    return render_template("work.html")
@app.route("/contact")
def contact():
    return render_template("contact.html")
@app.route("/analyze", methods=["POST"])
def analyze():
    try:
        # --- Get uploaded image ---
        file = request.files.get("image")
        if not file:
            return jsonify({"success": False, "error": "No image uploaded"})
        filename = secure_filename(file.filename)
        file_path = os.path.join(app.config["UPLOAD_FOLDER"], filename)
        file.save(file_path)
        #  Preprocess image
        img = load_img(file_path, target_size=(224, 224))
        img_array = img_to_array(img)
        img_array = np.expand_dims(img_array, axis=0)
        img_array = img_array / 255.0
        # Predict
        predictions = model.predict(img_array)
        confidence = float(np.max(predictions) * 100)
        predicted_class = CLASSES[np.argmax(predictions)]
        #  Remedies
        remedies = REMEDIES.get(predicted_class, ["No remedies available."])
        symptoms = request.form.getlist("symptoms")
        duration = request.form.get("duration")
        result = {
            "success": True,
            "condition": predicted_class,
            "confidence": round(confidence, 2),
            "recommendations": remedies,
            "symptoms": symptoms,
            "duration": duration
        }
        return jsonify(result)
    except Exception as e:
        return jsonify({"success": False, "error": str(e)})
if __name__ == "__main__":
    app.run(debug=True)
```

# 7.Software Testing

Testing validates that the website meets its functional and non-functional requirements. This phase ensures smooth operation of features like uploading images, selecting symptoms and duration, predicting skin concerns, and displaying general remedies.

1. **Unit Testing**
    - Individual components such as image upload, symptom selection, duration input, and result display were tested independently.
    - **Example:** Verifying that the uploaded image preview is displayed correctly or that selecting symptoms updates the form data.

2. **Integration Testing**
    - Ensures that different modules of the website (image upload, prediction engine, remedies display, etc.) work together seamlessly.
    - **Example:** Testing that an uploaded image and selected symptoms are both passed correctly to the prediction module and results are displayed with remedies.

3. **System Testing**
    - Validates the overall system, including navigation between pages (Home, How It Works, About, Contact), responsiveness, and output accuracy.
    - **Example:** Testing that after entering all required details (image, symptoms, duration), the system provides predictions with confidence scores and suggested remedies.

| Test Case | Expected Outcome | Result |
|---|---|---|
| Input Validation | All required fields (e.g., name, age, symptoms) must be validated before prediction | Pass |
| Skin condition prediction | Correct prediction result is displayed based on input data | Pass |
| Prediction failure | If model can't predict skin condition, default output will be shown as Unknown | Pass |
| Responsive design testing | Website displays properly on all devices. | Pass |

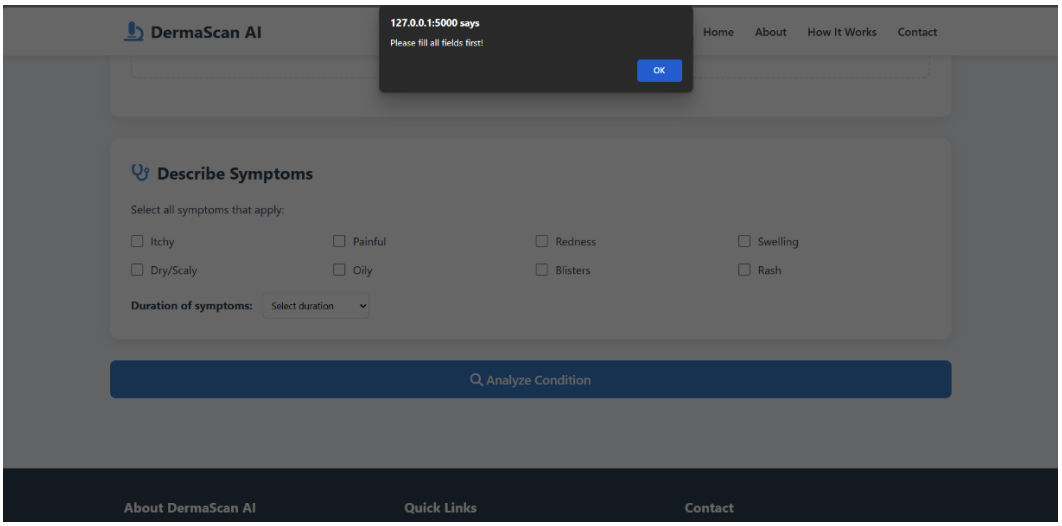


Figure 7.1

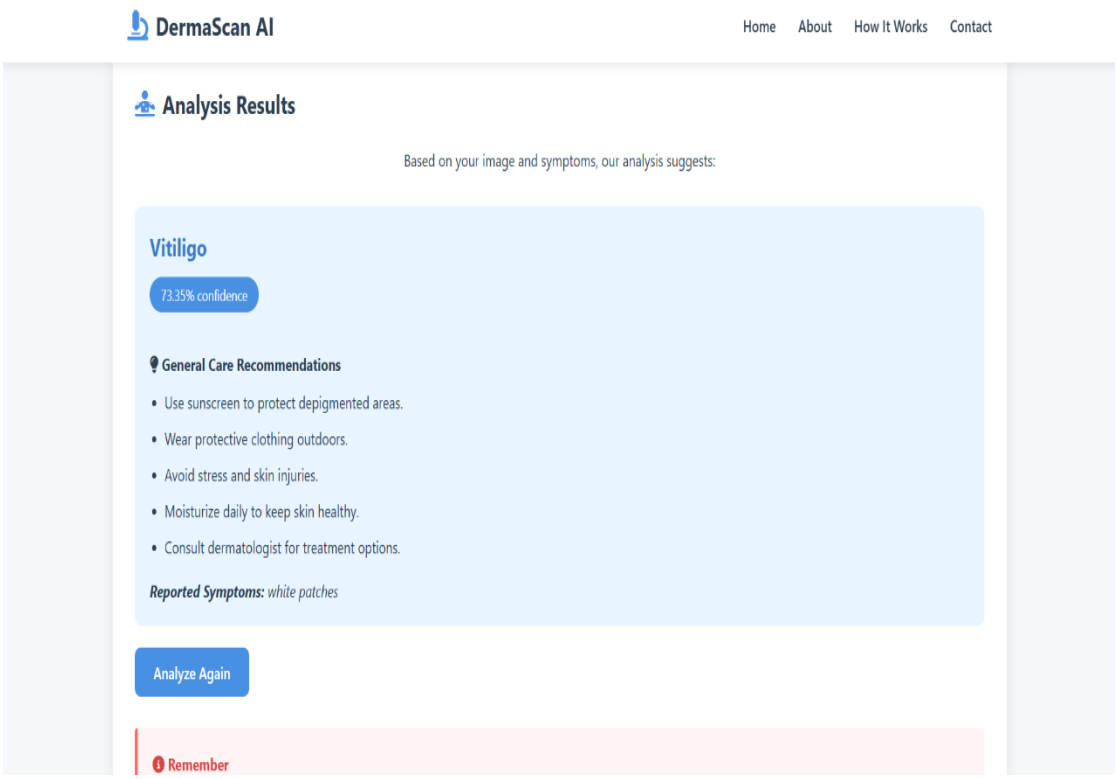
DermaScan AI
Home
About
How It Works
Contact
Analysis Results
Based on your image and symptoms, our analysis suggests:
Vitiligo
73.35% confidence
General Care Recommendations
Use sunscreen to protect depigmented areas.
Wear protective clothing outdoors.
Avoid stress and skin injuries.
Moisturize daily to keep skin healthy.
Consult dermatologist for treatment options.
Reported Symptoms: white patches
Analyze Again
Remember

Figure 7.2

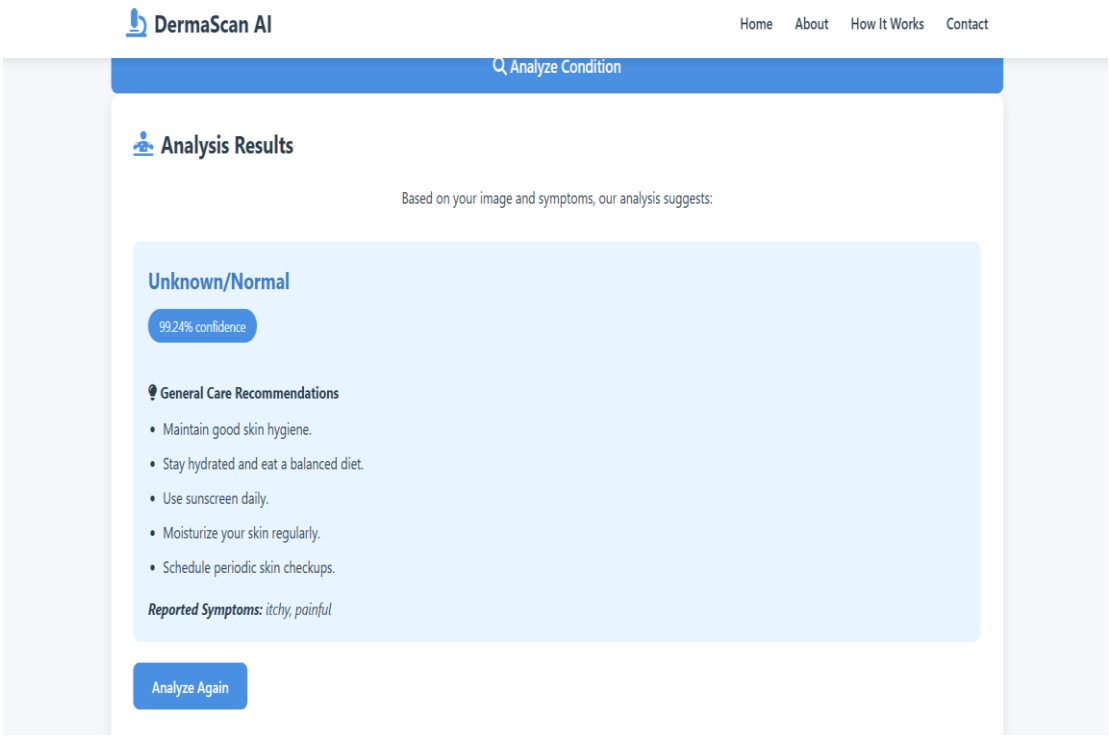
DermaScan AI
Home
About
How It Works
Contact
Analyze Condition
Analysis Results
Based on your image and symptoms, our analysis suggests:
Unknown/Normal
99.24% confidence
General Care Recommendations
Maintain good skin hygiene.
Stay hydrated and eat a balanced diet.
Use sunscreen daily.
Moisturize your skin regularly.
Schedule periodic skin checkups.
Reported Symptoms: itchy, painful
Analyze Again

Figure 7.3

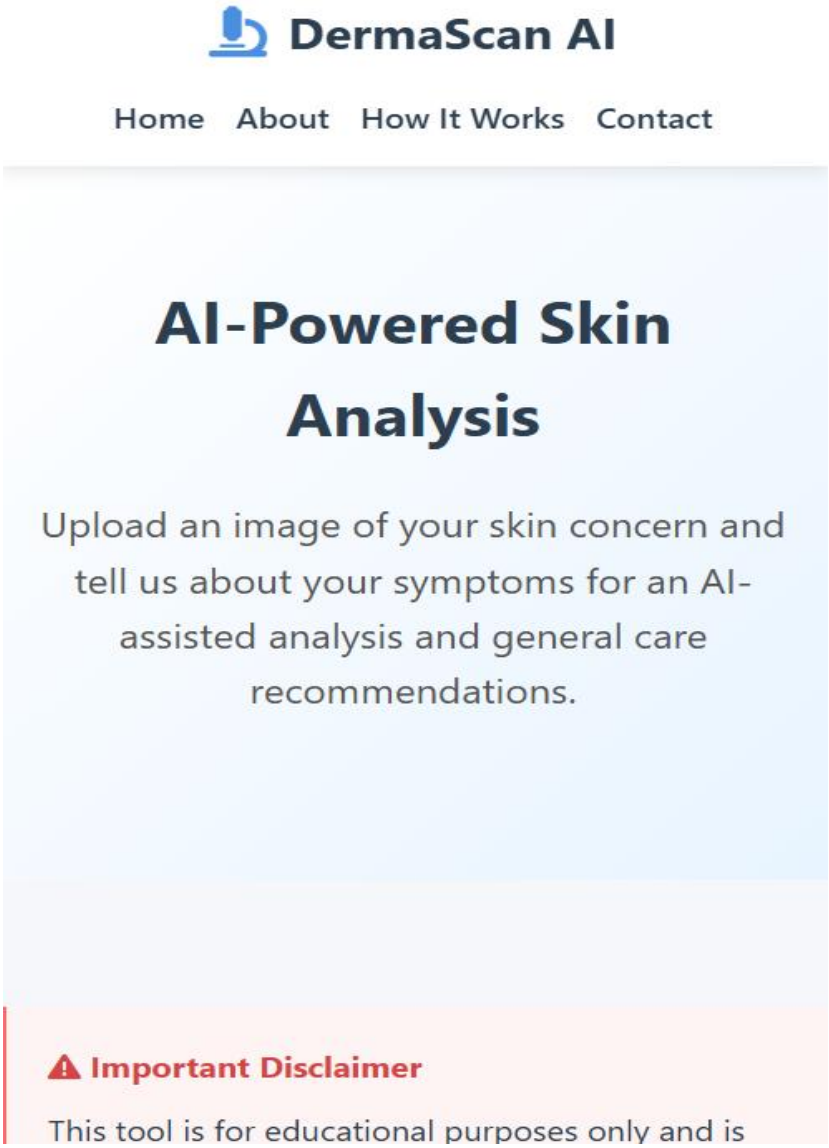
DermaScan AI
Home
About
How It Works
Contact
AI-Powered Skin Analysis
Upload an image of your skin concern and tell us about your symptoms for an AI-assisted analysis and general care recommendations.
Important Disclaimer
This tool is for educational purposes only and is

Figure 7.4

## 8. Future Scope

1. Backend Integration: Implementing backend technologies (database) to store user data, medical history, and improve personalized predictions.
2. AI Model Enhancement: Training the model with a larger and more diverse dataset to improve accuracy across rare and complex skin conditions.
3. Doctor Consultation Feature: Adding a telemedicine feature where users can connect with dermatologists for expert advice based on predictions.
4. Multi-Language Support: Providing predictions, recommendations, and UI in multiple languages to make the tool accessible to a wider audience.
5. Mobile Application: Creating a mobile app version for quick image uploads and instant predictions from smartphones.
6. Report Generation**:** Allowing users to download a detailed PDF report of their prediction, symptoms, and recommendations for offline reference.

## 9. Conclusion

The Skin Disease Prediction Website project aimed to provide users with a simple, accessible, and interactive platform to analyze skin conditions using AI-powered predictions. Through this project, we successfully implemented essential features such as image upload, symptom selection, and AI-based prediction results with detailed recommendations all within a user-friendly interface.

This project highlights the potential of combining front-end technologies with machine learning models to deliver healthcare assistance without requiring a complex backend setup. By focusing on usability, clear output, and quick analysis, the website empowers users to take a proactive step in understanding their skin health.

In conclusion, the Skin Disease Prediction Website not only fulfills its core objective of helping users identify possible skin conditions but also sets the stage for future expansion. With further improvements such as real-time consultations, multilingual support, and mobile app development, this platform can evolve into a powerful digital health assistant and contribute to early detection and better awareness of skin diseases.

# 10. Bibliography

## 10.1 Books


- Web Designing & Publishing
  Author- Prof. Satish Jain (Author), M. Geetha Iyer (Author)
  Publication- BPB Publications (25 June 2020)

- HTML, CSS & Java Script Web Publishing
  Author- LauraLemay (Author), Rafe Colburn (Author),
  Jennifer Kyrnin (Author)
  Publication- BPB Publications (15 July 2016)


## 10.2 Websites


- https://www.w3schools.com
- https://www.geeksforgeeks.com
- https://www.javatpoint.com
- https://www.tutorialspoint.com
- https://www.kaggle.com