Index.html

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="utf-8">
  <meta content="width=device-width, initial-scale=1.0" name="viewport">
  <title>ocular Disease Prediction</title>
  <meta content="" name="description">
  <meta content="" name="keywords">
  <!-- Google Fonts -->
  <link
href="https://fonts.googleapis.com/css?family=Open+Sans:300,300i,400,400i,600,600
i,700,700i|Lato:400,300,700,900" rel="stylesheet">
  <!-- Vendor CSS Files -->
  <link href="static/assets/vendor/bootstrap/css/bootstrap.min.css" rel="stylesheet">
  <link href="static/assets/vendor/bootstrap-icons/bootstrap-icons.css"
rel="stylesheet">
  <link href="static/assets/vendor/glightbox/css/glightbox.min.css" rel="stylesheet">
  <link href="static/assets/vendor/swiper/swiper-bundle.min.css" rel="stylesheet">
  <!-- Template Main CSS File -->
  <link href="static/assets/css/style.css" rel="stylesheet">
</head>
<body>
  <!-- ======= Header ======= -->
  <header id="header" class="fixed-top d-flex align-items-center">
    <div class="container d-flex align-items-center">
      <div class="logo me-auto">
        <h1><a href="index.html">OCDP</a></h1>
      </div>
      <nav id="navbar" class="navbar">
```

```
        <ul>
          <li><a class="nav-link scrollto active" href="#index.html">Home</a></li>
          <li><a class="nav-link scrollto" href="#about">About Us</a></li>
          <li><a class="nav-link scrollto" href="#services">Predict</a></li>
          <li><a class="nav-link scrollto" href="#team">Team</a></li>
        </ul>
        <i class="bi bi-list mobile-nav-toggle"></i>
      </nav><!-- .navbar -->
    </div>
  </header><!-- End #header -->
  <!-- ======= Hero Section ======= -->
  <section id="hero">
    <div class="hero-container">
      <img
src="https://static.wixstatic.com/media/84770f_354d7d9db0344028a08a2a46f2bf82cc
~mv2_d_3501_2554_s_4_2.jpg/v1/fill/w_980,h_436,al_c,q_85,usm_0.66_1.00_0.01,e
nc_auto/84770f_354d7d9db0344028a08a2a46f2bf82cc~mv2_d_3501_2554_s_4_2.jp
g" class="eye"/>
      <h1>Ocular Disease Prediction</h1>
      <h2>A Deep learning based ocular disease prediction proposed system using
CNN</h2>
      <a href="#services" class="btn-get-started scrollto">Get Started</a>
    </div>
  </section><!-- #hero -->
  <main id="main">
    <!-- ======= About Us Section ======= -->
    <!-- ======= About Us Section ======= -->
    <section id="about" class="about">
      <div class="container">
        <div class="section-title">
```

```
        <h2>About </h2>
      </div>
      <div class="row">
        <div class="col-lg-6 order-1 order-lg-2">
          <img src="static/assets/img/Eye.jpg" class="img-fluid" alt="" width="315"
height="315">
          <img src="static/assets/img/Eye2.jpg" class="img-fluid" alt="" width="315"
height="315">
        </div>
        <div class="col-lg-6 pt-4 pt-lg-0 order-2 order-lg-1">
          <h3>Deep learning based recognition of ocular disease in Fundus images
</h3>
          <ul>
            <li><i class="bi bi-check2-circle"></i> Glaucoma </li>
            <li><i class="bi bi-check2-circle"></i> Cataract </li>
            <li><i class="bi bi-check2-circle"></i> Diabetic retinopathy </li>
          </ul>
          <p>A fundus image is a high-resolution photograph of the back of the eye,
showing the retina, optic disc, macula, and blood vessels. It provides an important
view of the eye's interior and is used to diagnose and monitor a variety of eye
conditions, including glaucoma, diabetic retinopathy, and age-related macular
degeneration. Fundus imaging is a non-invasive and painless procedure, often
performed as part of a routine eye exam. With advances in technology and the
application of deep learning algorithms, fundus images can now be analyzed by
computers to detect and predict ocular diseases with high accuracy.</p>
        </div>
      </div>
    </div>
  </section><!-- End About Us Section -->
  <!-- ======= Services Section ======= -->
```

```
<section id="services" class="services section-bg">
  <div class="container">
    <div class="section-title">
      <h2>Prediction</h2>
      <p>This proposed system uses convolutional neural networks to classify healthy and non-healthy eyes based on fundus images. Separate binary classification models were developed for Glaucoma, Diabetic Retinopathy and Cataracts, to predict please upload your fundus image.</p>
    </div>
    <form action="{{ url_for('predict_disease') }}" method="post" enctype="multipart/form-data" class="p-5 bg-light">
      <h2 class="mb-4 text-center">Upload Your Fundus Image</h2>
      <div class="form-group mb-4">
        <label for="diseaseSelect">Select the disease you want to predict:</label>
        <div class="form-check mt-2">
          <input class="form-check-input" type="radio" name="disease" id="glaucomaRadio" value="glaucoma">
          <label class="form-check-label" for="glaucomaRadio">Glaucoma</label>
        </div>
        <div class="form-check mt-2">
          <input class="form-check-input" type="radio" name="disease" id="cataractRadio" value="cataract">
          <label class="form-check-label" for="cataractRadio">Cataract</label>
        </div>
        <div class="form-check mt-2">
          <input class="form-check-input" type="radio" name="disease" id="retinopathyRadio" value="retinopathy">
          <label class="form-check-label" for="retinopathyRadio">Diabetic Retinopathy</label>
        </div>
```

```
        </div>
        <div class="form-group">
          <div class="custom-file">
            <input type="file" class="custom-file-input" id="imageUpload" name="file">
            <label class="custom-file-label" for="imageUpload"></label>
          </div>
          <div class="mt-2">
            <span id="image-name"></span>
          </div>
        </div>
        <div class="text-center mt-4">
          <button type="submit" class="btn btn-primary px-5 py-3">Predict</button>
        </div>
      </form>
    </div>
  </section><!-- End Services Section -->
  <!-- ======= Our Team Section ======= -->
  <!-- ======= Our Team Section ======= -->
  <section id="team" class="team">
    <div class="container">
      <div class="section-title">
        <h2>Our Team</h2>
        <p>Our group has a keen interest in leveraging deep learning techniques for the accurate and early detection of ocular diseases. Through our research, we aim to develop a reliable deep learning model that can predict diseases such as glaucoma, cataract, and diabetic retinopathy with high accuracy</p>
      </div>
      <div class="row gy-4">
        <div class="col-lg-4 col-md-6">
          <div class="member">
```

```
        <img src="static/assets/img/team/Raj.jpg" alt="">
        <h4>Raj Kumar</h4>
        <span>211419205136</span>
        <p>
          Student at Panimalar Engineering College
        </p>
      </div>
    </div>
    <div class="col-lg-4 col-md-6">
      <div class="member">
        <img src="static/assets/img/team/Vettri.jpg" alt="">
        <h4>Vettri Chezhian</h4>
        <span>211419205175</span>
        <p>
          Student at Panimalar Engineering College
        </p>
      </div>
    </div>
    <div class="col-lg-4 col-md-6">
      <div class="member">
        <img src="static/assets/img/team/Nithish.jpg" alt="">
        <h4>Nithish Kumar</h4>
        <span>211419205119</span>
        <p>
          Student at Panimalar Engineering College
        </p>
      </div>
    </div>
  </div>
</div>
```

```
    </section><!-- End Our Team Section -->
  </main><!-- End #main -->
  <!-- ======= Footer ======= -->
  <footer id="footer">
    <div class="container">
      <div class="copyright">
        &copy; Copyright <strong><span>OCDP</span></strong>. All Rights Reserved
      </div>
      <div class="credits">
        <!-- All the links in the footer should remain intact. -->
        <!-- You can delete the links only if you purchased the pro version. -->
        <!-- Licensing information: https://bootstrapmade.com/license/ -->
        <!-- Purchase the pro version with working PHP/AJAX contact form:
https://bootstrapmade.com/free-one-page-bootstrap-template-amoeba/ -->
        Done by Batch 12
      </div>
    </div>
  </footer><!-- End #footer -->
  <a href="#" class="back-to-top d-flex align-items-center justify-content-center"><i
class="bi bi-arrow-up-short"></i></a>
  <!-- Vendor JS Files -->
  <script src="static/assets/vendor/bootstrap/js/bootstrap.bundle.min.js"></script>
  <script src="static/assets/vendor/glightbox/js/glightbox.min.js"></script>
  <script src="static/assets/vendor/isotope-layout/isotope.pkgd.min.js"></script>
  <script src="static/assets/vendor/swiper/swiper-bundle.min.js"></script>
  <script src="static/assets/vendor/php-email-form/validate.js"></script>
  <!-- Template Main JS File -->
  <script src="static/assets/js/main.js"></script>
</body>
</html>
```

Result.html

```
<!doctype html>
<html lang="en">
  <head>
    <!-- Required meta tags -->
    <meta charset="utf-8">
    <meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no">
    <!-- Bootstrap CSS -->
    <link rel="stylesheet" href="https://stackpath.bootstrapcdn.com/bootstrap/4.5.2/css/bootstrap.min.css" integrity="sha384-o+RDsa0aLu++PJvFqy93MScy+zq/aG1+NssTMOEYiMzR6JGKxp5q8NYgmiuW2Jsn" crossorigin="anonymous">
    <!-- Custom CSS -->
    <style>
      body {
        font-family: 'Open Sans', sans-serif;
        font-size: 20px;
        color: white;
        text-align: center;
        background : black;
      }
      h1, h5 {
        font-family: 'Montserrat', sans-serif;
        font-size: 36px;
        margin: 20px 0;
        color: white;
      }
```

```
      p {
        font-size: 24px;
        color: white;
      }
      img {
        max-width: 100%;
      }
    </style>
    <!-- Google Fonts -->
    <link rel="preconnect" href="https://fonts.gstatic.com">
    <link
href="https://fonts.googleapis.com/css2?family=Montserrat:wght@400;700&display=
swap" rel="stylesheet">
    <link
href="https://fonts.googleapis.com/css2?family=Open+Sans:wght@400;700&display
=swap" rel="stylesheet">
    <title>Prediction Results</title>
  </head>
  <body>
    <div class="container mt-5">
      <div class="row">
        <div class="col-md-6 mx-auto">
          <h1>Prediction Results </h1>
          <div class="card mb-3">
            <div class="card-header">
              <h3 class="card-title">{{ disease|capitalize }}</h3>
            </div>
            <div class="card-body">
              <p>The uploaded image has a {{ preds }} % probability of having {{
disease_found|capitalize }}.</p>
```

```
          </div>
        </div>
        <img class="img-fluid rounded" src="{{ url_for('static', filename='uploads/' +
filename) }}" alt="Fundus Image">
      </div>
    </div>
  </div>
  <!-- Optional JavaScript -->
  <!-- jQuery first, then Popper.js, then Bootstrap JS -->
  <script src="https://code.jquery.com/jquery-3.5.1.slim.min.js" integrity="sha384-
DfXdz2htPH0lsSSs5nCTpuj/zy4C+OGpamoFVy38MVBnE+IbbVYUew+OrCXaRkfj
" crossorigin="anonymous"></script>
  <script
src="https://cdn.jsdelivr.net/npm/@popperjs/core@2.9.3/dist/umd/popper.min.js"></s
cript>
  <script
src="https://cdn.jsdelivr.net/npm/bootstrap@5.1.3/dist/js/bootstrap.min.js"></script>
 </body>
</html>
```

App.py

```
from flask import Flask, render_template, request
import os
from tensorflow.keras.preprocessing import image
import numpy as np
import tensorflow as tf
from werkzeug.utils import secure_filename
app = Flask(__name__)
# Load the saved models
glaucoma_model = tf.keras.models.load_model('glaucoma_model.h5')
```

```
cataract_model = tf.keras.models.load_model('cataract_model.h5')
diabetic_retinopathy_model = tf.keras.models.load_model('retinopathy_model.h5')
# Define the allowed file extensions for uploaded images
ALLOWED_EXTENSIONS = {'png', 'jpg', 'jpeg'}
def allowed_file(filename):
    """Check if a file has an allowed extension"""
    return '.' in filename and filename.rsplit('.', 1)[1].lower() in
ALLOWED_EXTENSIONS
def predict(image_path, model):
    """Make a prediction on a fundus image using a given model"""
    img = tf.keras.preprocessing.image.load_img(image_path, target_size=(512, 512))
    x = image.img_to_array(img)
    x = x / 255.0
    x = np.expand_dims(x, axis=0)
    preds = model.predict(x)
    return preds[0][0]
@app.route('/')
def index():
    """Render the index page"""
    return render_template('index.html')
@app.route('/predict', methods=['POST'])
def predict_disease():
    """Make a prediction on an uploaded fundus image"""
    # Get the uploaded file
    file = request.files['file']
    # Check if file is empty
    if not file:
        return render_template('index.html', message='No file was uploaded.')
    # Check if the file has an allowed extension
    if not allowed_file(file.filename):
```

```
        return render_template('index.html', message='Invalid file type. Only PNG and JPEG files are allowed.')
    # Save the file to the uploads folder
    filename = secure_filename(file.filename)
    file_path = os.path.join('static/uploads', filename)
    file.save(file_path)
    # Determine which model to use based on user input
    model = None
    disease = request.form.get('disease')
    print(disease)
    if disease == 'glaucoma':
        model = glaucoma_model
    elif disease == 'cataract':
        model = cataract_model
    elif disease == 'retinopathy':
        model = diabetic_retinopathy_model
    # Make a prediction using the selected model
    if model:
        preds = predict(file_path, model)
        if preds < 0.9:
            disease_found = disease
            disease = "No Diseases Found"
        else:
            disease_found = disease
        predicted = preds * 100
        predicted_prob = round(predicted, 2)
        return render_template('result.html', preds=predicted_prob, disease=disease, disease_found=disease_found, filename=filename)
    else:
        return render_template('index.html', message='Invalid disease selected.')
```

```
if __name__ == '__main__':
    app.run(debug=True)
```