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DISEASES PREDICTION THROUGH WEB APPLICATION

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ABSTRACT

Big knowledge includes a vital half in an exceedingly range of companies, however it's mostly essential to the chop-chop growing health care trade. It plays a vital role by providing an outsized set of information points, constructing a sturdy system that permits for higher and a lot of correct ends up in malady detection. knowledge science plays an important role in medical fields with higher support for diagnosing and cure for the malady. During this project, we have a tendency to square measure about to predict numerous diseases like cancer, diabetes, heart, liver, kidney, respiratory disorder by victimization totally different machine learning models to urge a higher result. of these machine learning models square measure integrated to net application victimization flask.

Keywords: Health Care Trade, Numerous Diseases, Predict, Flask.

I. INTRODUCTION

In recent years, the event of computing (AI) and also the gradual starting of AI's analysis within the medical field have allowed individuals to check the superb prospects of the combination of AI and attention. Among them, the recent deep learning field has shown bigger potential in applications like sickness prediction and drug response prediction. From the initial supplying regression model to the machine learning model, then to the deep learning model these days, the accuracy of medical sickness prediction has been ceaselessly improved, and therefore the performance all told aspects has also been considerably improved. we have a tendency to improved some basic deep learning frameworks and a few common diseases and summarizes the deep learning prediction ways similar to totally different diseases. show a series of issues within the current sickness prediction and create a break for the longer-term development. It aims to clarify the effectiveness of deep learning in sickness prediction and demonstrates the high correlation between deep learning and also the medical field in future development. The distinctive feature extraction ways of deep learning ways will still play a crucial role in future medical analysis. Advancement in analytical models, handiness of GPU hardware, and cloud infrastructure began to play a important role in attention practices and analysis. it's various tools and techniques to archive, manage, analyze, and predict giant volumes of structures, unstructured and semi structured knowledge. knowledge Science plays an important role in medical fields with higher support for identification and cure for the diseases. during this project, we have a tendency to aiming to predict multiple diseases like cancer, Diabetes, heart, liver, kidney, malaria, respiratory illness by victimization totally different machine learning models.

II. METHODOLOGY

Method and analysis that is performed in your analysis work ought to be written during this section. an easy strategy to follow is to use keywords from your title in initial few sentences.

Existing System

Prediction using traditional disease risk model usually involves a machine learning and supervised learning algorithm which uses training data with the labels for training of the models. High risk and Low risk patient classification is done in groups test sets. In the existing system for a model the accuracy is not up to the mark. Only one disease is present in existing system.

Disadvantages of Existing system

- In the existing system the model the accuracy is not up to the mark

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- Only one disease is present in existing system
- Prediction of the disease results in not accurate

Proposed System

In our proposed system, we combine the structured and unstructured data in healthcare fields that let us assess the risk of diseases and increasing the accuracy by performing different methods. We implement the multiple disease predictor that integrated to web-based application. Prediction of the disease results in accurate. Multiple Diseases can be predicted using our system.

Benefits

Here we can predict more diseases in single web application.

III. MODELING AND ANALYSIS

Data science plays an important role in medical fields with higher support for identification and cure for the illness. it's projected that, each a pair of months, over seventieth of the population in Asian country contains a tendency toward general body ailments like infectious agent flu, cough, and cold. Etc. Since tons of individuals do not realize that the symptoms of those regular diseases could also be symptoms into one thing a lot of prejudicial, twenty fifth of the population succumbs to death because of cognitive content of the first signs. Hence, the identification of the diseases within the initial stages is crucial for the hindrance of any unwarranted casualties. this medical system is principally dedicated to terribly specific, well-known diseases and is basically unequipped to spot and accurately predict diseases supported early signs. The purpose of our system is to create predictions for the many diseases like polygenic disease, cancer, heart, liver, urinary organ and respiratory illness. The system applies data processing techniques, will pre-processing on the info and so implements the Machine Learning algorithms. this technique can predict the potential disorder for a selected illness in internet application supported the given parameters as associate degree input to the model.

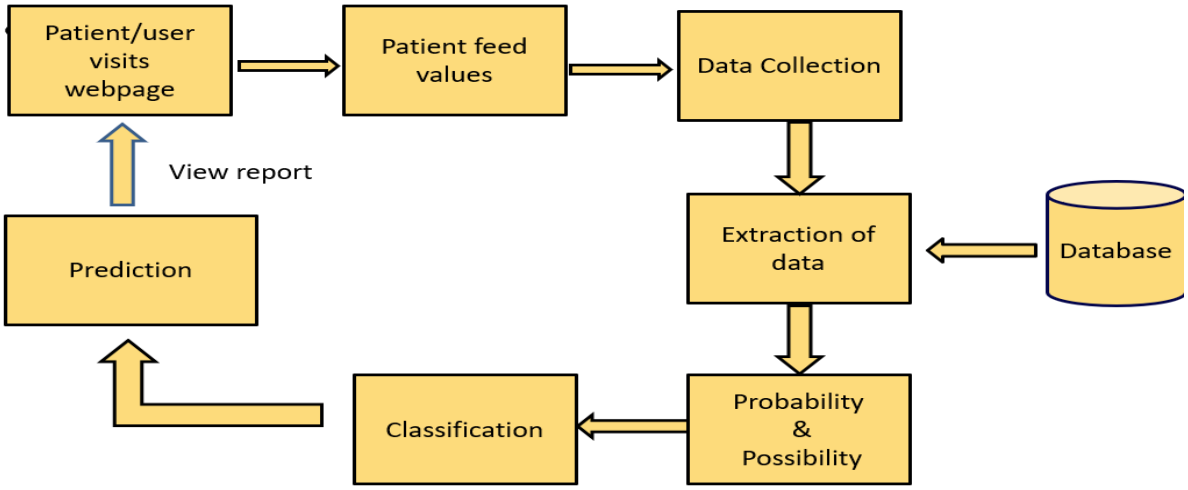

Figure 1: Architecture

Algorithm

Algorithms we are used in our project is random forest and support vector machine

Random Forest:

Random forest could be a supervised learning rule that is employed for each classification furthermore as regression. however but, it's in the main used for classification issues. As we all know that a forest is formed of trees and additional trees means that additional sturdy forest. Similarly, random forest rule creates call trees on information samples and so gets the prediction from every of the mind finally selects the most effective resolution by means that of vote. it's AN ensemble technique that is healthier than one call tree as a result of it reduces the overfitting by averaging the result.

Random Forest rule Pseudocode:

• Step 1: initial, begin with the choice of random samples from a given dataset.

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• Step 2–Next, this rule can construct a choice tree for each sample. Then it'll get the prediction result from each call tree.

• Step 3: during this step, vote are going to be performed for each foreseen result.

• Step 4: ultimately, choose the foremost voted prediction result because the final prediction result.

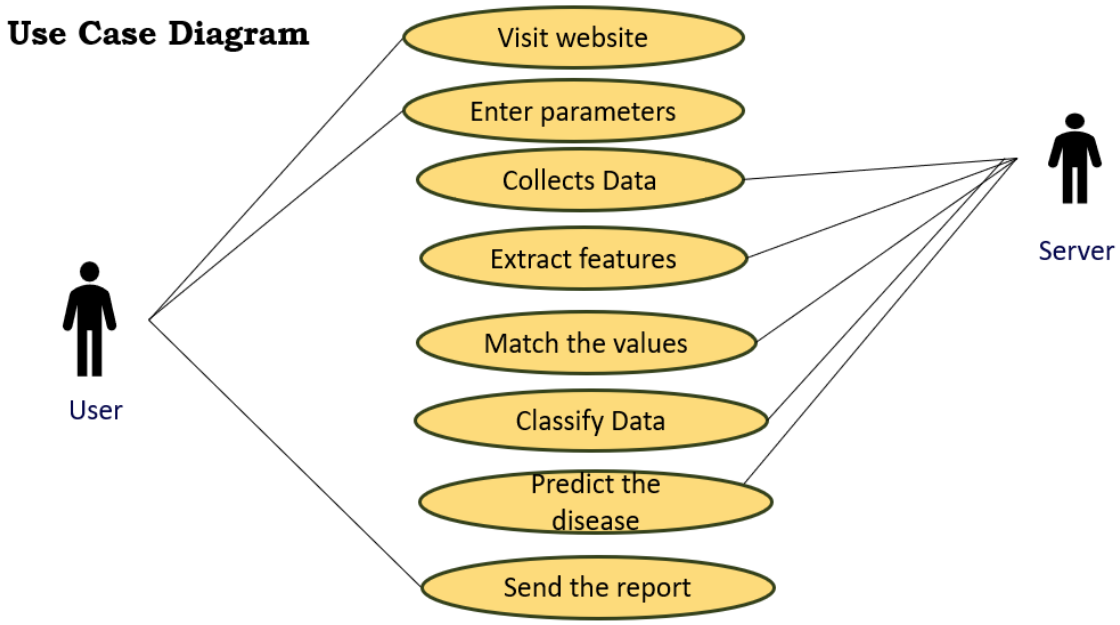
Support vector machine (SVM)

Support vector machine may be a powerful supervised machine learning algorithmic rule that works on linearly Associate in Nursing non-linearly dissociable information it finds an best hyperplane that best separates our information, so area the gap} from a nearest purpose during a space to itself is maximized. Hyperplane may be a plane of (n-1) dimensions in n dimensional feature area, that separates the 2 categories, like for a 2-D feature area it'll be a line and for three-D feature area it'll be a plane. Hyperplane is essentially the choice boundary for our classifier, we'll one by one classify information supported that region of hyperplane the information falls.

$h(x) = wT. x + b$

w – weight vector

b – scalar bias



Software Requirements:

HTML, CSS

Tools and Libraries: Flask, sklearn, Pandas, NumPy, Jupyter Notebook, OpenCV

Language : python

Hardware Requirements:

- Processor: Any Processor above 500 MHz
- RAM: 512Mb
- Hard Disk: 30 GB
- Input device: Standard Keyboard and Mouse
- Output device: VGA and High-Resolution Monitor

IV. RESULTS AND DISCUSSION

The web application was created successfully we used flask frame work for backend and html for frontend. Flask follows the model view controller architecture. The application was tested successfully. The user needs to provide information, which is stored in model of flask, and the data is input for the trained machine learning algorithms. And finally displayed the output in new html page like if the patient has serious issue it displays consult doctor otherwise you are healthy.

It has 3 main pages:

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Main view page program

```python
from flask import Flask, render_template, request, flash, redirect
import pickle
import numpy as np
from PIL import Image
from tensorflow.keras.models import load_model



app = Flask(__name__)

def predict(values, dic):
    if len(values) == 8:
        model = pickle.load(open('models/diabetes.pkl','rb'))
        values = np.asarray(values)
        return model.predict(values.reshape(1, -1))[0]
    elif len(values) == 26:
        model = pickle.load(open('models/breast_cancer.pkl','rb'))
        values = np.asarray(values)
        return model.predict(values.reshape(1, -1))[0]
    elif len(values) == 13:
        model = pickle.load(open('models/heart.pkl','rb'))
        values = np.asarray(values)
        return model.predict(values.reshape(1, -1))[0]
    elif len(values) == 18:
        model = pickle.load(open('models/kidney.pkl','rb'))
        values = np.asarray(values)
        return model.predict(values.reshape(1, -1))[0]
    elif len(values) == 10:
        model = pickle.load(open('models/liver.pkl','rb'))
        values = np.asarray(values)
        return model.predict(values.reshape(1, -1))[0]
```

```python
@app.route("/malariapredict", methods = ['POST', 'GET'])
def malariapredictPage():
    if request.method == 'POST':
        try:
            if 'image' in request.files:
                img = Image.open(request.files['image'])
                img = img.resize((36,36))
                img = np.asarray(img)
                img = img.reshape((1,36,36,3))
                img = img.astype(np.float64)
                model = load_model("models/malaria.h5")
                pred = np.argmax(model.predict(img)[0])
        except:
            message = "Please upload an Image"
            return render_template('malaria.html', message = message)
    return render_template('malaria_predict.html', pred = pred)
```

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Home page program:

```
{% extends 'main.html' %}
{% block content %}
{% if message %}
        <div class="alert alert-danger">{{ message }}</div>
    {% endif %}
<div class="container">
    <div class="card card-body" style="border: 1px solid black; box-shadow: 0 0 10px black;">
        <h2>This is basic Machine Learning and Deep Learning based WebApp.</h2>
        <p>These Machine Learning models and Deep Leaning models are trained on large datasets and thousands of images.</p>
        <br>
        <h2>Model Accuracies:</h2>
        <ul>
            <li>Diabetes Model: <strong>75.36%</strong></li>
            <li>Breast Cancer Model: <strong>98.25%</strong></li>
            <li>Heart Disease Model: <strong>85.25%</strong></li>
            <li>Kidney Disease Model: <strong>99%</strong></li>
            <li>Liver Disease Model: <strong>78%</strong></li>
            <li>Malaria Model: <strong>96%</strong></li>
            <li>Pneumonia Model: <strong>95%</strong></li>
        </ul>
        <br>
        <h3>Information about the Diseases which this webApp can predict.</h3>
        <br>
        <div class="row">
            <div class="col-md-12 card card-body" style="box-shadow: 0 0 5px black; margin: 5px;">
                <h4>Diabetes</h4>
                <p>Diabetes is a disease that occurs when your blood glucose, also called blood sugar, is too high. Blood glucose is your
                <h5>Symptoms</h5>
                <ul>
                    <li>Urinating often.</li>
                    <li>Feeling very thirsty.</li>
                    <li>Extreme fatigue.</li>
                    <li>Blurry vision.</li>
                </ul>
            </div>
        </div>
        <br>
```

And finally predict page program

```
{% extends 'main.html' %}
{% block content %}
    <div class="row"  style="margin-bottom: 477px;">
        <div class="col-md-3"></div>
        <div class="col-md-6">
            {% if pred == 1 %}
                <div class="card card-body alert alert-danger"><center>Sorry! Please consult DOCTOR.</center></div>
            {% else %}
                <div class="card card-body alert alert-success"><center>Great! You are HEALTHY.</center></div>
            {% endif %}
            <div class="row">
                <div class="col-md-4"></div>
                <div class="col-md-4"><a href="{{ url_for('home') }}" class="btn btn-block btn-primary">Back to Home</a></div>
                <div class="col-md-4"></div>
            </div>
        </div>
        <div class="col-md-3"></div>
    </div>
{% endblock %}
```

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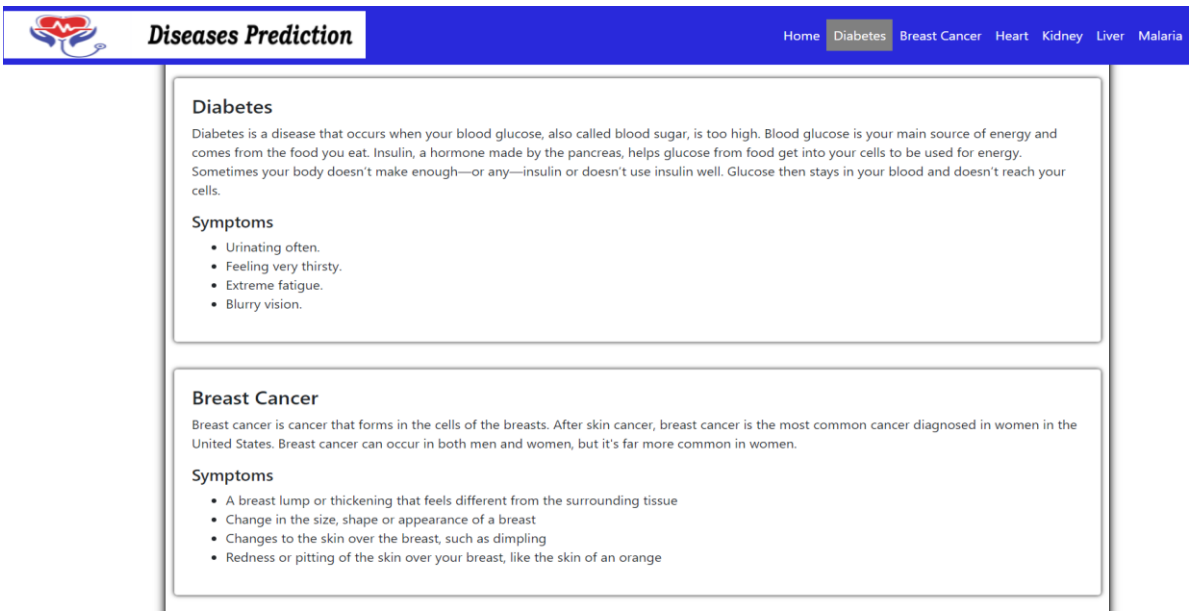
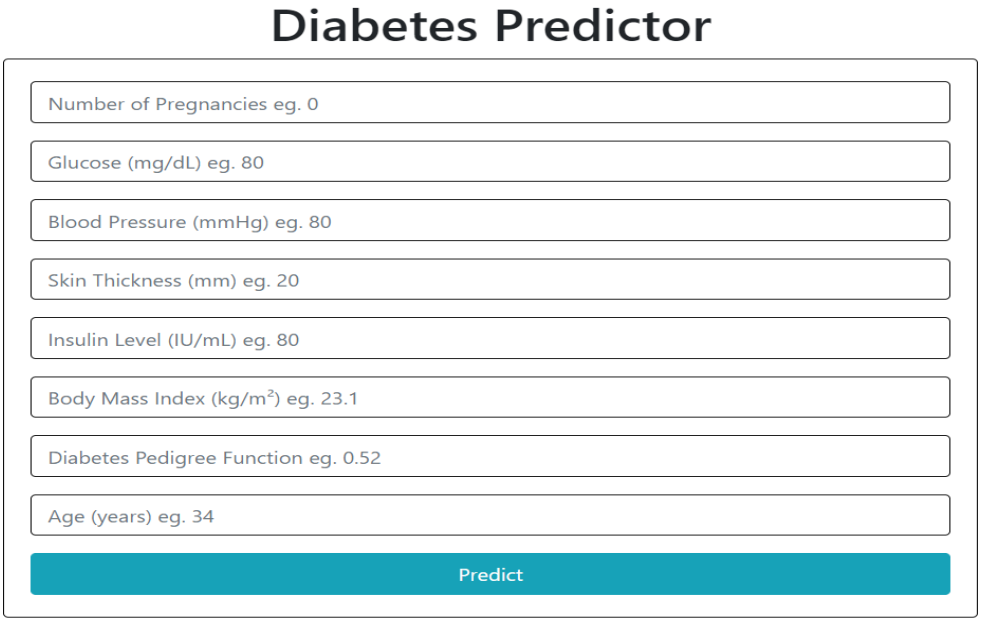
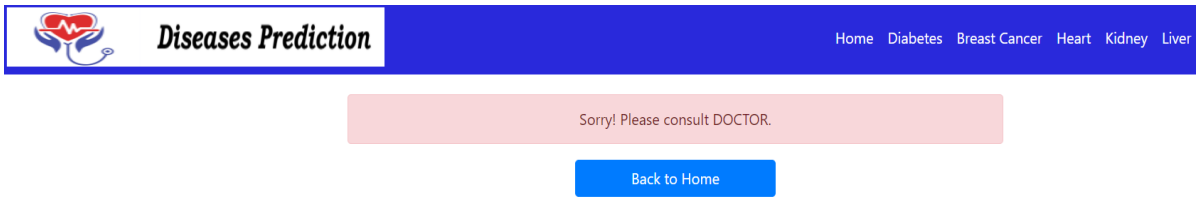
Output:



Here click on diseases like diabetes , heart on top right. Then it shows like,



After giving the required input it will predict and displays like,



Tested using the reports of diabetes patient so displayed as please consult doctor.

V. CONCLUSION

The web application is successfully created, user needs to provide information, which is stored in model of flask, and the data is input for the trained machine learning algorithms. Here we used Random Forest and svm classification algorithms which will produce better accuracy . And finally displayed the output in new html page like if the patient has serious issue it displays consult doctor otherwise it displays as you are healthy. The application is tested fine and properly debugged.

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