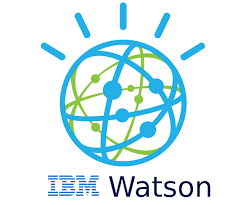
**Machine Learning Model Deploymentn with IBMCloud Watson Studio**



|  |  |
| --- | --- |
| Topic | Phase 4: Development Part 2 |
| Team Member | 1.HALISH RICHARD J (**TL**)  2. MOHAMED ATHIL M  3. ARUSAMY A  4. RAHUL DRAVID A |

**Prerequisites**

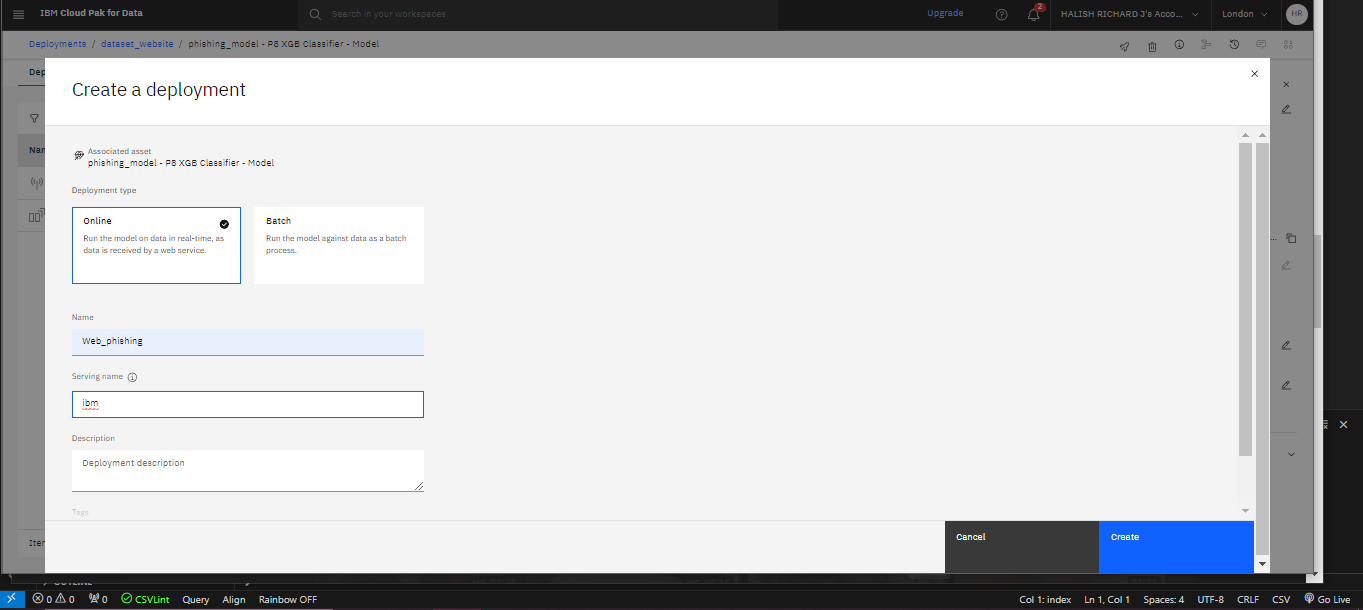
* An IBM Cloud Account
* An account on IBM Cloud Pak for Data.
* Python (Flask,Pickel)

**Steps**

1. Create deployment as online type .
2. Copy private end point link and API.
3. Develop flask program for get the Data model.
4. Develop web site for UI for input and output.

Creating deployment as online type by using Xgboost-Model.

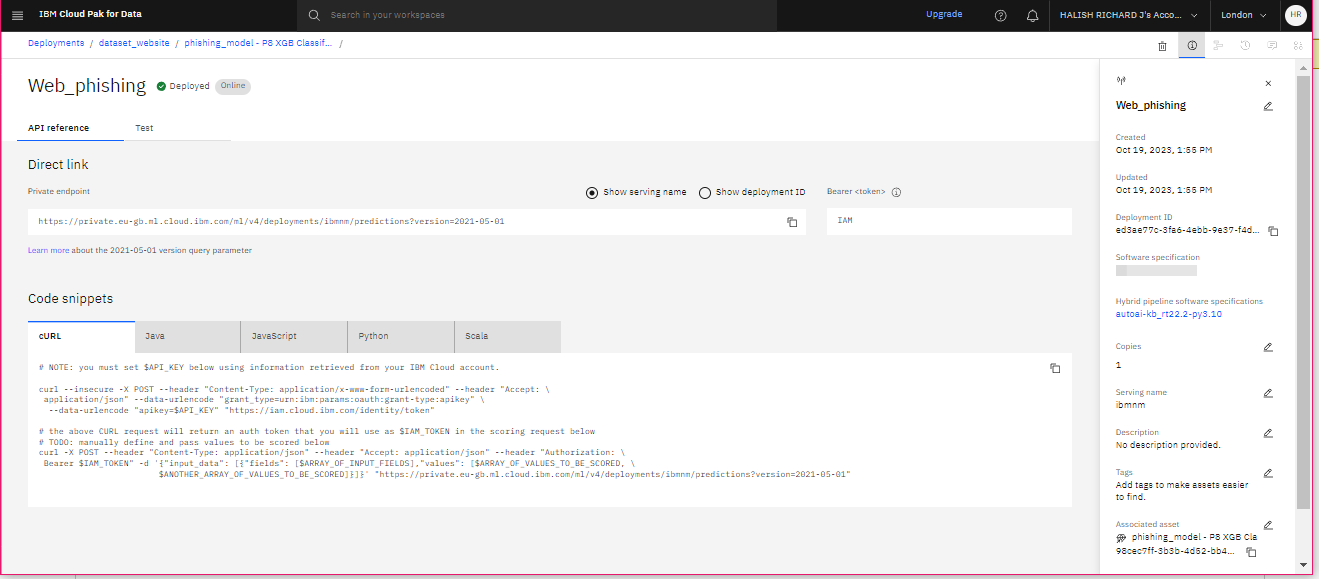
That can be available for Continue building.

**Fig-1**

Copy the private end point link

'https://private.eu-gb.ml.cloud.ibm.com/ml/v4/deployments/ed3ae77c-3fa6-4ebb-9e37-f4d99de5823b/predictions?version=2021-05-01'

That can be connect data model deployment to for our logic program.



**Fig-2**

Develop a flask application for connect IBM Watson Studio to getting information about our machine learning model.

**app.py**

from flask import Flask, render\_template, request

import numpy as np

import pandas as pd

from sklearn import metrics

import warnings

import pickle

warnings.filterwarnings('ignore')

from features import FeatureExtraction

from flask\_mysqldb import MySQL

import requests

# NOTE: you must manually set API\_KEY below using information retrieved from your IBM Cloud account.

API\_KEY = "6NZgUAO90FAOvaPc-aMSH5Z3l-yfOJPNrSq8cYcGNEde"  # for security reasons haven't displayed API key

token\_response = requests.post('https://iam.cloud.ibm.com/identity/token', data={"apikey":

                                                                                     API\_KEY,

                                                                                 "grant\_type": 'urn:ibm:params:oauth:grant-type:apikey'})

mltoken = token\_response.json()["access\_token"]

header = {'Content-Type': 'application/json', 'Authorization': 'Bearer ' + mltoken}

app = Flask(\_\_name\_\_)

app.config['MYSQL\_HOST'] = 'localhost'

app.config['MYSQL\_USER'] = 'root'

app.config['MYSQL\_PASSWORD'] = ''

app.config['MYSQL\_DB'] = 'report'

mysql = MySQL(app)

xgb = pickle.load(open("XGBoostClassifier.pkl", "rb"))

@app.route("/", methods=["GET", "POST"])

def home():

    if request.method == "POST":

        url = request.form["url"]

        obj = FeatureExtraction(url)

        x = np.array(obj.getFeaturesList()).reshape(1, 13)

        print(x)

        t = [obj.getFeaturesList()]

        print("t")

        print(t)

        # NOTE: manually define and pass the array(s) of values to be scored in the next line

        payload\_scoring = {"input\_data": [

            {"fields": [['f0', 'f1', 'f2', 'f3', 'f4', 'f5', 'f6', 'f7', 'f8', 'f9', 'f10', 'f11', 'f12']],

             "values": t}]}

        response\_scoring = requests.post(

            'https://private.eu-gb.ml.cloud.ibm.com/ml/v4/deployments/ed3ae77c-3fa6-4ebb-9e37-f4d99de5823b/predictions?version=2021-05-01',

            json=payload\_scoring, headers={'Authorization': 'Bearer ' + mltoken})

        print("Scoring response")

        print(response\_scoring.json())

        y\_pred = xgb.predict(x)[0]

        print(y\_pred)

        y\_pro\_phishing = xgb.predict\_proba(x)[0, 0]

        print(y\_pro\_phishing)

        y\_pro\_non\_phishing = xgb.predict\_proba(x)[0, 1]

        print(y\_pro\_non\_phishing)

        if (y\_pro\_phishing \* 100 < 60):

            msg = "Trick or Treat?\n Look at this tweet.\n This site is elite!\n"

            flag = 1

        else:

            msg = "Trick or Treat?\n Don't get deceit.\n This site is creep!\n"

            flag = -1

        return render\_template('result.html', msg=msg, url=url, val=flag)

    return render\_template("index.html")

if \_\_name\_\_ == '\_\_main\_\_':

    app.run(debug=True)

For UI to be develop a web page detect web phishing so We develop web page for single text input form and button for submit as Detect.

As click the Detect button that can be redirect to result page.

**Index.html**

<!DOCTYPE html>

<html lang="en">

<head>

    <meta http-equiv="Content-Type" content="text/html; charset=utf-8" />

<!-- Primary Meta Tags -->

<title>HookPhish</title>

<meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no">

<meta name="title" content="HookPhish">

<meta name="author" content="HookPhish">

<!-- Favicon -->

<link rel="apple-touch-icon" sizes="180x180" href="../static/assets/img/favicon/apple-touch-icon.png">

<link rel="icon" type="image/png" sizes="32x32" href="../static/assets/img/favicon/favicon-32x32.png">

<link rel="icon" type="image/png" sizes="16x16" href="../static/assets/img/favicon/favicon-16x16.png">

<link rel="manifest" href="../static/assets/img/favicon/site.webmanifest">

<!-- Fontawesome -->

<link type="text/css" href="../static/vendor/@fortawesome/fontawesome-free/css/all.min.css" rel="stylesheet">

<!-- Pixel CSS -->

<link type="text/css" href="../static/css/neumorphism.css" rel="stylesheet">

</head>

<body>

    <main>

        <!-- Hero -->

        <div class="section section-header ">

            <div class="container">

                <div class="row justify-content-center">

                    <div class="col-12 col-lg-8 text-center">

                        <h1 class="display-2 mb-4">We are HookPhish</h1>

                           <form action="/" method ="post" class="lead mb-5">

                            <div class="form-group">

                                <div class="input-group">

                                    <div class="input-group-prepend">

                                        <span class="input-group-text"><span class="fa fa-link"></span></span>

                                    </div>

                                    <input class="form-control" id="url" name="url" placeholder="URL (https://www.google.com/)" type="text" aria-label="url-input" required>

                                </div>

                            </div>

                            <button type="submit" class="btn btn-danger"><span class="fa fa-user-secret mr-2"></span>Detect</button>

                        </form>

                </div>

            </div>

        </div>

        <!-- End of Hero section -->

        </div>

    </main>

    <!-- Core -->

<script src="../static/vendor/jquery/dist/jquery.min.js"></script>

<script src="../static/vendor/popper.js/dist/umd/popper.min.js"></script>

<script src="../static/vendor/bootstrap/dist/js/bootstrap.min.js"></script>

<script src="../static/vendor/headroom.js/dist/headroom.min.js"></script>

<!-- Vendor JS -->

<script src="../static/vendor/onscreen/dist/on-screen.umd.min.js"></script>

<script src="../static/vendor/nouislider/distribute/nouislider.min.js"></script>

<script src="../static/vendor/bootstrap-datepicker/dist/js/bootstrap-datepicker.min.js"></script>

<script src="../static/vendor/waypoints/lib/jquery.waypoints.min.js"></script>

<script src="../static/vendor/jarallax/dist/jarallax.min.js"></script>

<script src="../static/vendor/jquery.counterup/jquery.counterup.min.js"></script>

<script src="../static/vendor/jquery-countdown/dist/jquery.countdown.min.js"></script>

<script src="../static/vendor/smooth-scroll/dist/smooth-scroll.polyfills.min.js"></script>

<script src="../static/vendor/prismjs/prism.js"></script>

<script async defer src="https://buttons.github.io/buttons.js"></script>

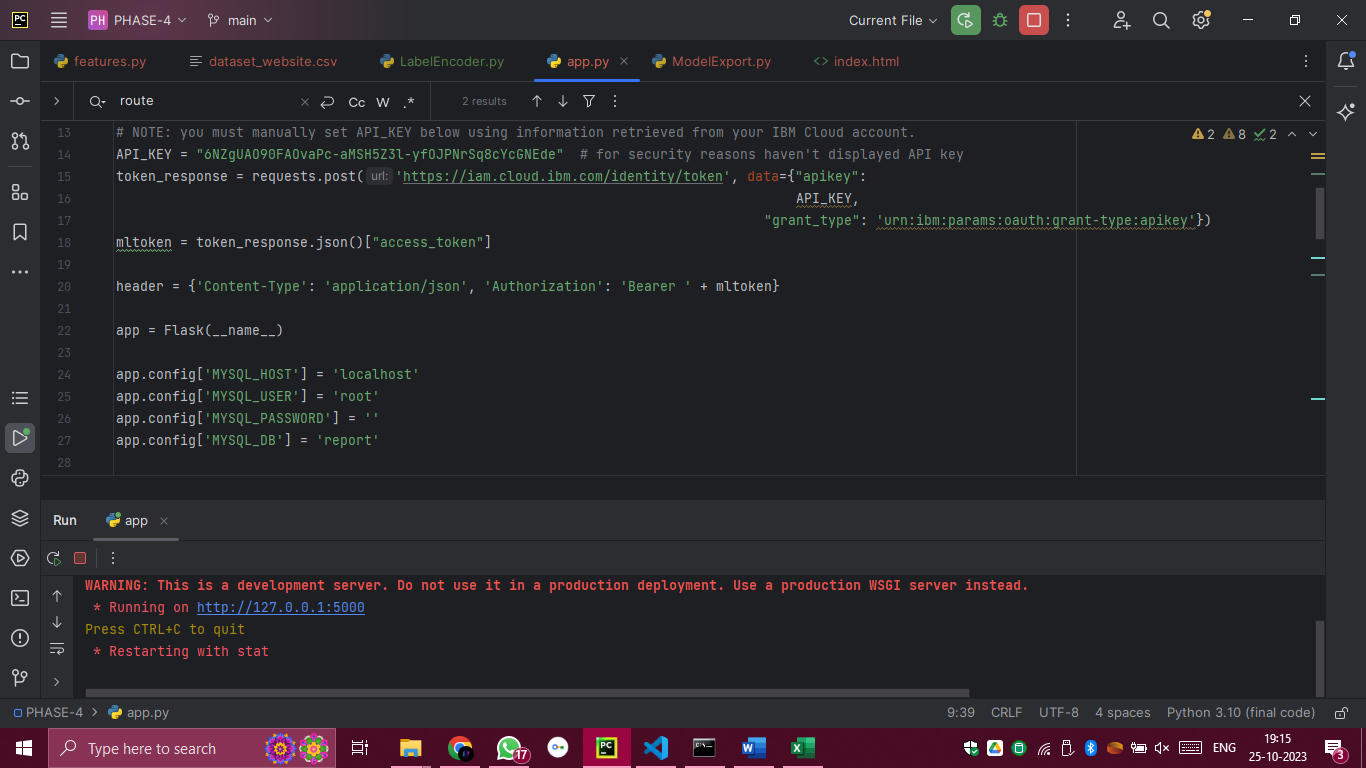
<!-- Neumorphism JS -->

<script src="../static/assets/js/neumorphism.js"></script>

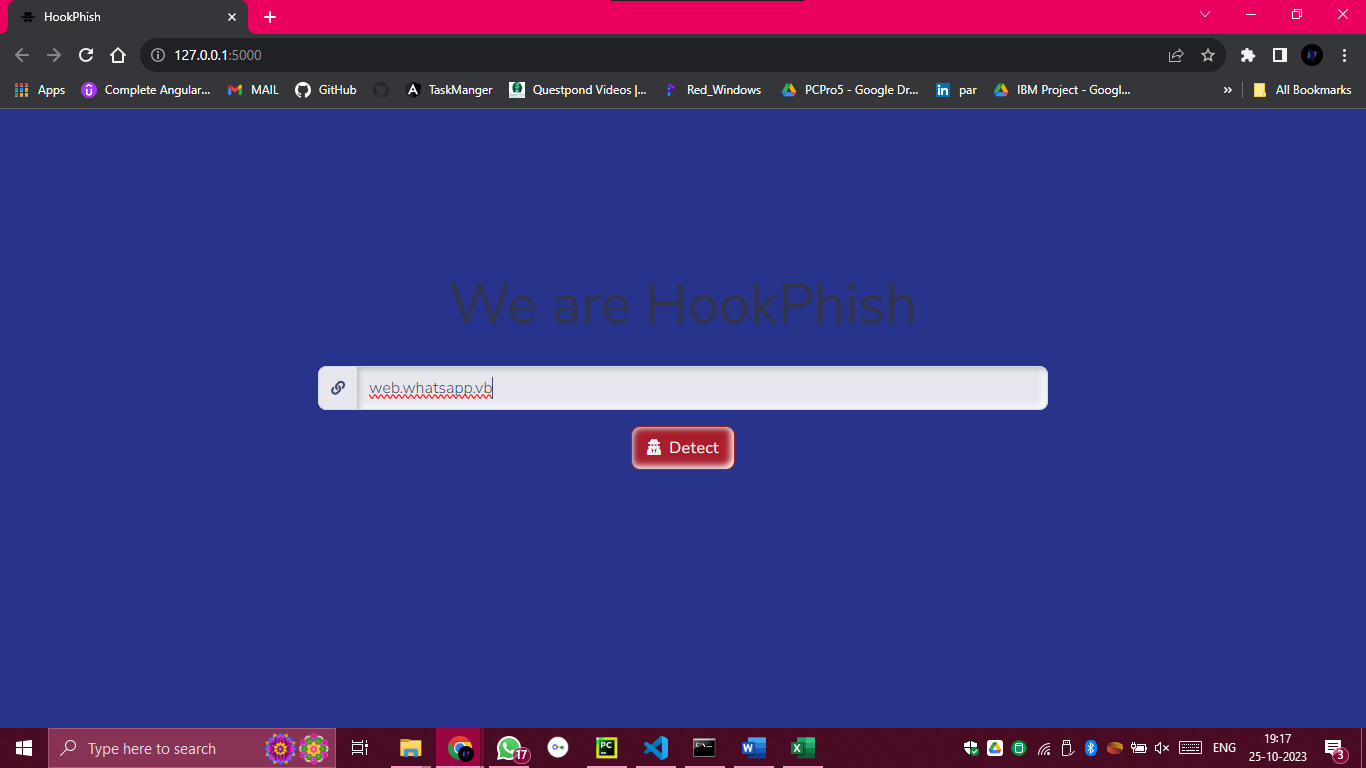
</body>

</html>

Just run Flask application that can running on <http://127.0.0.1:5000/> .

**Fig-3**

We just give example for [**https://web.whatsapp.vb**](https://web.whatsapp.vb)as whatapp link.



**Fig-5**

**result.html**

<!DOCTYPE html>

<html lang="en">

<head>

    <meta http-equiv="Content-Type" content="text/html; charset=utf-8" />

<!-- Primary Meta Tags -->

<title>HookPhish</title>

<!-- Fontawesome -->

<link type="text/css" href="../static/vendor/@fortawesome/fontawesome-free/css/all.min.css" rel="stylesheet">

<!-- Pixel CSS -->

<link type="text/css" href="../static/css/neumorphism.css" rel="stylesheet">

</head>

<body>

    <header class="header-global">

</header>

    <main>

        <!-- Result -->

        <div class="section section-header pb-7">

            <div class="container">

                <div class="row justify-content-center">

                    <div class="col-12 col-lg-8 text-center">

                        <h1 class="display-2 mb-4">Result</h1>

                        <p class="lead">Is <a href= {{ url }} target="\_blank">{{ url }}</a> safe to use?</p>

                        <br>

                        <h3><pre>{{ msg }}</pre></h3>

                        <br>

                        <br>

                        <br>

                        <br>

                        <button type="submit" class="btn btn-primary button1" onclick="window.open('{{url}}')" target="\_blank"><span class="fa fa-arrow-up mr-2"></span>Proceed to this site!</button>

                    </div>

            </div>

        </div>

    </div>

    </main>

    <!-- Core -->

<script src="../static/vendor/jquery/dist/jquery.min.js"></script>

<script src="../static/vendor/popper.js/dist/umd/popper.min.js"></script>

<script src="../static/vendor/bootstrap/dist/js/bootstrap.min.js"></script>

<script src="../static/vendor/headroom.js/dist/headroom.min.js"></script>

<!-- Vendor JS -->

<script src="../static/vendor/onscreen/dist/on-screen.umd.min.js"></script>

<script src="../static/vendor/nouislider/distribute/nouislider.min.js"></script>

<script src="../static/vendor/bootstrap-datepicker/dist/js/bootstrap-datepicker.min.js"></script>

<script src="../static/vendor/waypoints/lib/jquery.waypoints.min.js"></script>

<script src="../static/vendor/jarallax/dist/jarallax.min.js"></script>

<script src="../static/vendor/jquery.counterup/jquery.counterup.min.js"></script>

<script src="../static/vendor/jquery-countdown/dist/jquery.countdown.min.js"></script>

<script src="../static/vendor/smooth-scroll/dist/smooth-scroll.polyfills.min.js"></script>

<script src="../static/vendor/prismjs/prism.js"></script>

<script async defer src="https://buttons.github.io/buttons.js"></script>

<!-- Neumorphism JS -->

<script src="../static/assets/js/neumorphism.js"></script>

<script>

    let x= '{{val}}'

    if(x==1){

        document.getElementById('phishing').style.display = 'none';

    }else{

        document.getElementById('legitimate').style.display = 'none';

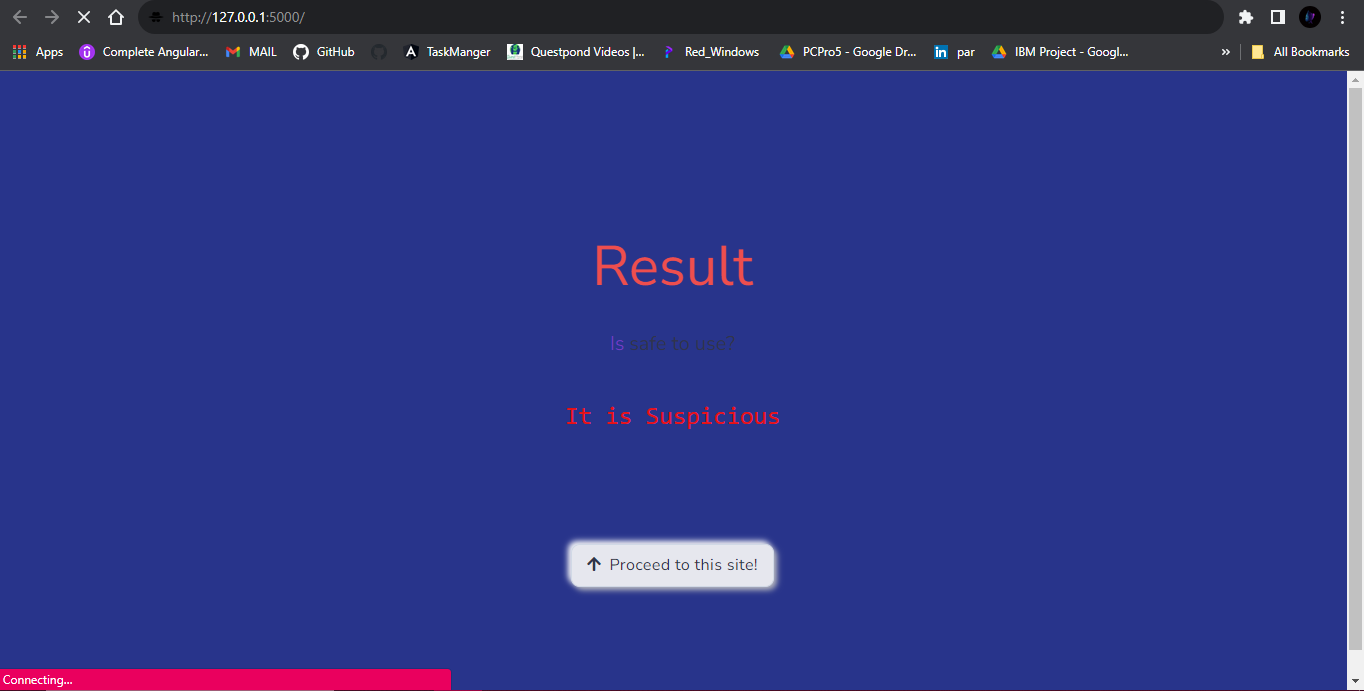
    }

</script>

</body>

</html>

A whatapp link is Suspicious.



**Fig-6**