WEB PHISHING DETECTION

NALAIYA THIRAN PROJECT BASED LEARNING ON PROFESSIONAL READINES FOR INNOVATION ,EMPLOYMENT AND ENTERPRENEURSHIP

PROJECT REPORT

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1. INTRODUCTION:

A.PROJECT OVERVIEW:

In recent times, Phishing becomes an important area of concern for security researchers because it is not difficult to develop the phishing website, which looks so close to legitimate website. Experts can identify phishingwebsites but not all the users can identify the phishing website and such users become the victim of phishingattack. Main aim of the attacker is to steal banks account details and personal information. In United States businesses, there is a loss of US$2billion per year becausetheir clients become victim to phishing. As per Index Report releasedin 2020, it was estimatedthat the annual worldwide impact of phishingcould be as high as $1.6 million.Phishing attacks are becoming successfulbecause lack of user awareness. Since phishing attack exploits the weaknesses found in users, it is very difficult to reduce them but it is very important to enhance phishing detection techniques. In recent times, Phishing becomesan important area of concern for security researchers because it is not difficultto develop the phishing website,which looks so close to legitimate website.Experts can identifyphishing websites but not all the users can identifythe phishing websiteand such users become the victim of phishing attack. Main aim of the attacker is to steal banks accountdetails and personalinformation. In United States businesses, there is a loss of US$2billion per year because their clients become victim to phishing.As per Index Report releasedin 2020, it was estimatedthat the annual worldwide impact of phishingcould be as high as $1.6 million.Phishing attacks are becoming successful because lack of user awareness.Since phishing attack exploits the weaknesses found in users, it is very difficultto reduce them but it is very importantto enhance phishingdetection techniques.

ABSTRACT:

There are a number of users who purchase products online and make payments through e-Banking. There are e-banking websites that ask users as username, password & credit card details, etc., often for malicious reasons. This type of e-banking websites is known as phishing website. Web phishing is one many security threats to web services on the internet. The main aim of web phishing is to steal private information, such as usernames, passwords, and credit card details, by way of impersonating a legitimate entity.

It will lead to information disclosure and property damage. Large organization may get trapped in different kinds of scams. To overcome this type of scams we are applying a machine-learning algorithm to detect phishing websites. In order to detect and predict e-banking websites, we proposed an intelligent, flexible and effective system that is based on using classification algorithms. We implemented classification algorithms and techniques to extract the phishing datasets criteria to classify their legitimacy.

The e-banking phishing website can be detected based on some important characteristics like URL and domain identity, and security and encryption criteria in the final phishing detection rate. Once a user makes payment through e-banking website our system will use the data mining algorithm to detect whether the e-banking website is a phishing website or not.

B.PURPOSE:

It is extension of listing technique. In this technique, features of the websites are extractedsuch as URL's, content and they are used for comparison among different sites. If they match then those new websites are considered as phishing sites. Theseare better than listing techniques and their results gives more accuracy but their response time is low A different approachfor detection of zero-hour phishing attack is discussed.

2.LITERATURE SURVEY :

Literature review Introduction: In recent times, Phishingbecomes an importantarea of concern for security researchers because it is not difficult to develop the phishing website,which looks so closeto legitimate website. Expertscan identify phishingwebsites but not all the users can identify the phishing websiteand such users become the victim of phishing attack. Main aim of the attacker is to steal banks accountdetails and personalinformation. In United States businesses, there is a loss of US$2billion per year because their clients become victim to phishing.As per Index Report releasedin 2020, it was estimated that the annual worldwide impact of phishingcould be as high as $1.6 million.Phishing attacks are becoming successful because lack of user awareness. Since phishing attack exploits the weaknesses found in users, it is very difficultto reduce them but it is very important to enhance phishing detection techniques. In recent times, Phishing becomes an important area of concern for security researchers because it is not difficult to develop the phishing website, which looks so close to legitimate website. Experts can identify phishingwebsites but not all the users can identify the phishing websiteand such users become the victim of phishing attack. Main aim of the attacker is to steal banks accountdetails and personal information. In United States businesses, there is a loss of US$2billion per year because their clients become victim to phishing. As per Index Report releasedin 2020, it was estimatedthat the annual worldwide impact of phishingcould be as high as $1.6 million.Phishing attacks are becoming successfulbecause lack of user awareness. Since phishing attack exploits the weaknesses found.

in users, it is very difficult to reduce them but it is very important to enhance phishing detectiontechniques. Literature review: phishing detection and protection scheme (1): Developing with the anti-phishing methods, phishers use various phishingmethods and more complex and hard-to-detect approaches.

straightforward way for a phisher to swindle people is to make the phishing web page similar to their target. However,many distinctive and features can distinguish the original legitimate website from the clone phishing website like the spelling error, image alteration, long URL address and abnormalDNS

records. The full list is revealedin Table 3 which is used later in our analysis and classification study. If an attacker clones a legitimatewebsite as a whole or designed to look similar as they usually do in most attacks in recent times,ourapproach is that similar looking phishing web page con-tent is not left for the users to check for the indicator or the authenticity attentively, but can detect by automated methods.Our approach is based on website phishing detectionusing the featuresof the site, content and their appear-ance. These properties are stored in a local database (Excel table) as a knowledge model and first compared with the newly loaded site at the time of loading againstthe dangerous web page offline.After the comparison was unable to detect the similarity, then the critical approach to compare the legitimate and fake using the features of the website with machine learning for an intelligent decision.

The critical contribution of our approach includes Result:The output is determined by the classifier, in the phishingdetection stage which predicts if the web page is suspicious, legiti-mate or phishing. The knowledge model and plug-in developmentwill be developedat a later stage.

System detection related work (2): Nowadays most people uses internet forvarious purposes such as online shopping like purchasing or selling products,chat with friends,sending mail. Internetusers now spend more time on social networking sites Information can spread very fast and easily within the social media networks.Social media systems depend onusers for content contribution and sharing. Facebook had over 1.3 billion active users as of June 2014. there are over 1.3 billion(the number is keep growing) pages from various categories, such as company,product/service, musician/band,local business, politician, government, actor/director,artist, athlete, author,book, health, beauty,movie, cars, clothing,

community. Fans not only can see information submittedby the page, but also can post comments, photos and videos to the page. Result: Domain anomaly features are used to identify possiblemalicious domains based on lexical and reputationfactors, whereas social anomaly features represent anomaloususer behaviors in social communications.

Learning to Detect Phishing Emails (3): An alternative for detecting these attacks is a relevant process of reliability of machine on a trait intended for the reflection of the besieged deceptionof user by means of electronic communication. This approach can be used in the detection of phishing websites, or the text messagessent through emails that are used for trapping the victims.

Approximately, 800 phishing mails and 7,000 non-phishing mails are traced till date and are detected accurately over 95% of them along with the categorization on the basis of 0.09% of the genuine emails. Result: We can just wrap up with the methods for identifying the deception, along with the progressing natureof attacks.

Phishing websites machinelearning (4): Phishing URL is a widely used and common technique for cybersecurity attacks.Phishing is a cybercrime that tries to trick the targeted users into exposingtheir private and sensitive information to the attacker.The motive of the attacker is to gain access to personalinformation such as usernames, login credentials, passwords, financial account details, social networking data, and personal addresses.These private credentials are then often used for malicious activities such as identity theft, notoriety, financial gain, reputation damage, and many more illegal activities. This paper aims to provide a comprehensive and comparative study of variousexisting free servicesystems and research-based systems used for phishing website detection. The systems in this survey range from different detection techniques and tools used by many researchers. The approach included in these researched papers ranges from Blacklist and Heuristic featuresto visual and content-based features.The studies

presented here use advancedmachine learning and deep learningalgorithms to achieve better precisionand higher accuracywhile categorizing websitesas phishing or benign. This article would provide a better understanding of the currenttrends and existingsystems in the phishing detectiondomain. Result: PhishingURL detection plays a pivotal role for many cybersecurity softwareand applications. In this paper, we researched and reviewed works based on the advanced machine learningtechniques and approachesthat promise a fresh approachin this domain.

A.EXISTING PROBLEM:

To detect phishingsites, the existingsystem employs Classifiers, Fusion Algorithms, and Bayesian Models.learning based methods extract features from the third party, search engine, etc. Therefore, they

are complicated, slow in nature, and not fit forthe real-time environment. To solve this problem, this paper presentsa machine learningbased novel anti-phishing approach that extractsthe features from client side only. Below architecture diagramas shown in Fig. 1. represents mainly flow of training phase to Detectionphase. First data need to be pre-processed and feature extraction using different feature sets and later we need to train this dataset withthe corresponding algorithms and the output is displayed.Result: In future we can use a combination of any other two or more classifierto get maximum accuracy. We can also explore various phishing techniques that uses Lexicalfeatures.Text and visual material can be classified by the classifiers. Text classifiers are used to categorise text material, whereas Image classifiers are used to categorise image content. The threshold value is calculatedusing a Bayesian model. The Fusion Algorithm uses the results of both classifiers to determine whether or not the site is phishing.Correct classification ratio, F-score, Matthews' correlation coefficient, False negative ratio, and False alarm ratio are usedto evaluate the performance of different classifiers

B.REFERENCES:

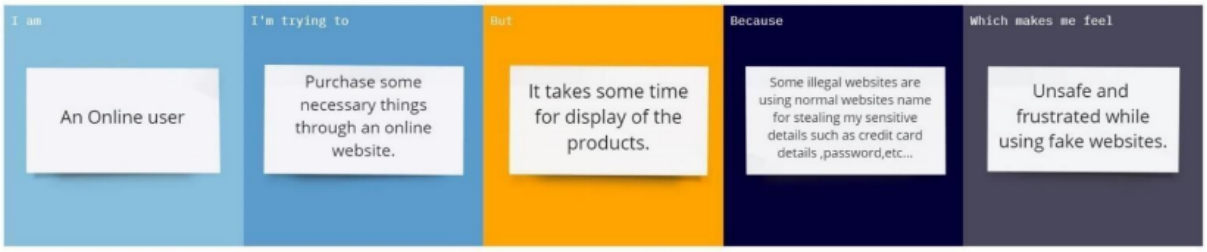
TITLE	PROBLEM IDENTIFIED	METHODOLOGY	STRENGTH	WEAKNESS
Phish Shield: A desktop application to detect phishing webpages through heuristic approach (Rao & ali,2015)	To detect URL and website content of phishing pages	Heuristic approach	Ability to detect zero hour phishing attacks & increased speed in detecting speed in detecting phishing attack	High computational cost,inability to immediately update the whitelist & blacklist
Mitigating cyber	To tackle	Semantic content	Detecting of	It achieved 80%
identity fraud advanced multi anti phishing technique(Yusuf et al,2013)	loopholes in electronic payment system security challenges in online banking transaction	analysis,Earth mover Distance(EMD) & biometric authentication with finger print	phishing webpages & preventing unauthorized online banking transfer & withdrawal	true negative
Efficient prediction of phishing website using supervised learning algorithms,Santhana Laksmi.v & vijaya MS,2011	Phishers are using new techniques to break all antiphishing mechanisms	Supervised learning algm,ie,.multi layer perceptron ,decision tree induction & machine learning techniques to model the prediction task & naive Bayes classification to explore result	It can predict whether a given website is legitimate or phishing website	Time taken to build the model & predictions accuracy is high in the case of decision tree induction
Anti phishing based on automated individual whitelist (AIWL)YE	Blacklist is not completely effective in detecting phishing URL because of	Naive bayesian classifier	It keeps a whitelist of users all familiar login user interface(LUIs)of website .it guides	It requires gathering the website IP & this is time consulting as IP needs to be

C.PROBLEM STATEMENT:

An online user needed to purchase something through an online. So, he entered into the online website through internet. It takes some time to displayite. At last he found the needed products. After that he entered all the credit card details, username and password for purchasing the things through online. Then he received the message "Your order is placed and transaction is successfully completed. You will receive the ordered product within 2 days". After that within 24 hours he got a message in mobile and the bank account was empty then the customer shocked .Then only he realized that was a fake website and his bank account details was stolen by hacker .To avoid this scenario. We need to solve this problem by using the Web Phishing Detection. the product. He started to see all the products. He search the necessary things in online webs

I am	An online user
I'm trying to	Purchase some necessary things through an online website.
But	It takes some time for display of the products.
Because	Some illegal websites are using normal websites name for stealing my sensitive details such as credit card details ,username ,password ,etc..
Which makes me feel	Unsafe and frustrated while using fake websites

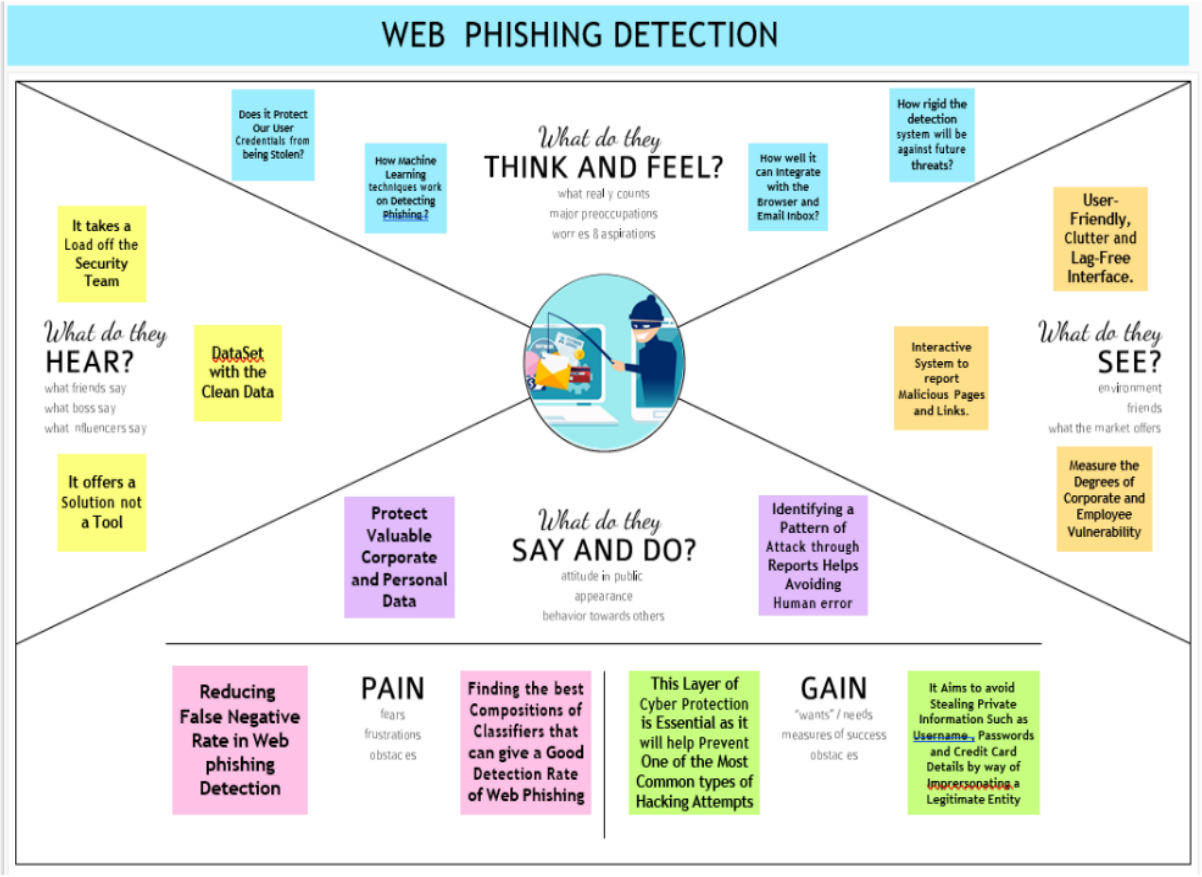
PROBLEM STATEMENT TEMPLATE:



Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makesme feel
PS-1	An Online user	Purchase some necessary things through an online website.	It takes some time for displayof the products.	Some illegal websitesare name for stealing my sensitive details such as credit card details, password ,etc.,	Unsafe and frustrated whileusing fake websites.
PS-2	Customer	Open an website inthe browser	Some websites are not secure and our details gotstolen.	We may not be awareof the secure or infectious websites.	That our information gets stolen and our bank details gets hacked by the fakeweb users.

3.IDEATION & PROPOSED SOLUTION:

A.EMPATHY MAP CANVAS



B.IDEATION & BRAINSTORMING:

Brainstorming provides a free and open environment that encourages everyone within a team to participate in the creative thinking process that leads to problem solving. Prioritizing volume over value, out-of-the-box ideas are welcome and built upon, and all participants are encouraged to collaborate, helping each other develop a rich amount of creative solution

Before you collaborate

A little bit of preparation goes a long way with this session. Here's what you need to do to get going.

10 minutes

A **Team gathering**
Define who should participate in the session and send an invite. Share relevant information or pre-work ahead.

B **Set the goal**
Think about the problem you'll be focusing on solving in the brainstorming session.

C **Learn how to use the facilitation tools**
Use the Facilitation Superpowers to run a happy and productive session.

Open article →

Team ID : PNT2022TMID16590
Team Lead :
Sripathi C
Team members :
Sanjay K
Sanjay S
Venkatesan B

1 Define your problem statement

What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm.

5 minutes

PROBLEM

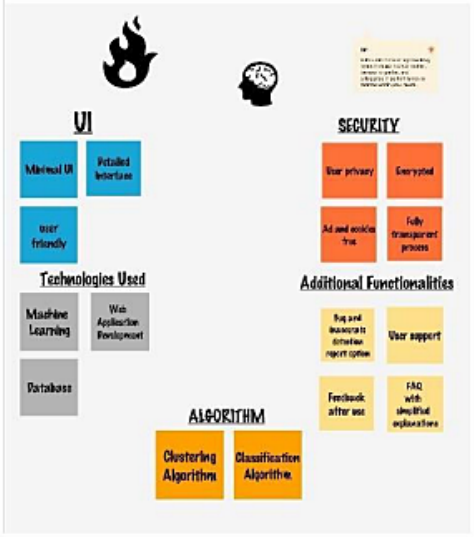
Phishing is a type of fraud in which the perpetrator sends emails or uses other communication channels to pose as a trustworthy entity or person in an effort to get sensitive information, such as login passwords or account information. in order to detect this kind of fraud activity we need a solution

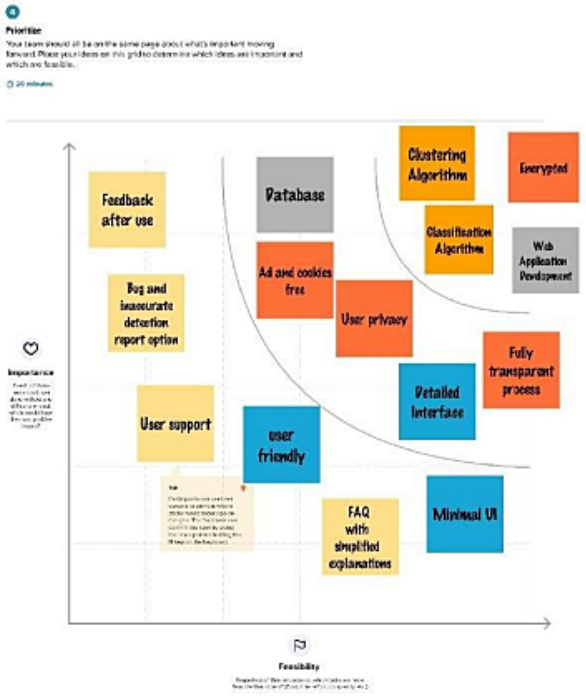
Key rules of brainstorming

To run an smooth and productive session

- Stay in topic.
- Encourage wild ideas.
- Defer judgment.
- Listen to others.
- Go for volume.
- If possible, be visual.


KALLEDA MANOJ KUMAR
Trustability based on users
Comfortable interface
Clustering Algorithm
Cross platform Usability
KOTA HARI SRI RAGHAVENDRA
Simple and stylish UI
support service
Classification Algorithm
web extension add-on
RAYALA VIJAY SAGAR
FAQ tab
Quick results
Classification Algorithm
Lesser processing power/memory req
NAVEEN R
highly foolproof
No ads or cookies
User feedback option
Clustering Algorithm


UI
Minimal UI
Detailed Interface
user friendly
SECURITY
User privacy
Encrypted
Ad and cookies free
Fully transparent process
Technologies Used
Machine Learning
Web Application Development
Database
Additional Functionalities
Bug and inaccurate detection report option
User support
Feedback after use
FAQ with simplified explanations
ALGORITHM
Clustering Algorithm
Classification Algorithm


Feedback after use
Database
Clustering Algorithm
Encrypted
Classification Algorithm
Web Application Development
Ad and cookies free
Bug and inaccurate detection report option
User privacy
Fully transparent process
Detailed Interface
User support
user friendly
FAQ with simplified explanations
Minimal UI
Importance
Feasibility

C.PROPOSED SOLUTION:

Sno.	Parameter	Description
1.	Problem Statement	An online user needed to purchase something through an online. So he entered into the online website through internet. It takes some time to display the product. He started to see all the products. He search the necessary things in online website. At last he found the needed products. After that he entered all the credit card details, username and password for purchasing the things through online. Then he received the message "Your orderis placed and transaction is successfully completed. You will receive the ordered product within 2 days". After thatwithin 24 hours he got a message in mobile and the bank account was empty then the customer shocked . Then onlyhe realized that was a fake website and his bank account details was stolen by hacker .To avoid this scenario. We need to solve this problem by using the Web Phishing Detection.
2.	Solution description	To overcome the problem of phishing website whenever we are clicking on one website it must show an alert box like it is a secure website or it is not a secure website Then another way is that we can scan the website in order to prevent our system or mobile from the phishingattack. Even though technologies are there we as the userhave to be aware of the websites whether it is secure or not. We should not click any unwanted websites.
3.	Uniqueness	The proposed approach has divided the hyperlink specific features into 12 different categories and used these features to train the machine learning algorithms.We have evaluated the performance of our proposed phishing detection approach on various classification algorithms using the phishingand non-phishing websites dataset.

D.PROBLEM SOLUTIONFIT:

Define CS, fit into CC

1. CUSTOMER SEGMENT(S) CS

An internet user who is willing to shop products online.

An enterprise user surfing through the internet for some information.

6. CUSTOMER CONSTRAINTS CC

Customers have very little awareness on phishing websites.

They don't know what to do after losing data.

5. AVAILABLE SOLUTIONS AS

Which solutions are available

The already available solutions are blocking such phishing sites and by triggering a message to the customer about dangerous nature of the website.

But the blocking of phishing sites are not more affective as the attackers use a different/new site to steal potential data thus a AI/ML model can be used to prevent customers from these kinds of sites from stealing data

Explore AS, differentiate

Focus on J&P, tap into BE, understand RC

2. JOBS-TO-BE-DONE / PROBLEMS J&P

The phishing websites must be detected in a earlier stage .

The user can be blocked from entering such sites for the prevention of such issues.

9. PROBLEM ROOT CAUSE RC

The hackers use new ways to cheat the naïve users.

Very limited research is performed on this part of the internet.

7. BEHAVIOUR BE

The option to check the legitimacy of the Websites is provided.

Users get an idea what to do and more importantly what not to do.

Focus on J&P, tap into BE, understand RC

Identify strong TR & EM

3. TRIGGERS TR

A trigger message can be popped warning the user about the site.

Phishing sites can be blocked by the ISP and can show a "site is blocked" or "phishing site detected" message.

4. EMOTIONS: BEFORE / AFTER EM

How do customers feel when they face a problem or a job and afterwards?

The customers feel lost and insecure to use the internet after facing such issues.

Unwanted panicking of the customers is felt after encounter loss of potential data to such sites.

10. YOUR SOLUTION SL

An option for the users to check the legitimacy of the websites is provided.

This increases the awareness among users and prevents misuse of data, data theft etc.,

8. CHANNELS of BEHAVIOUR CH

8.1 ONLINE

Customers tend to lose their data to phishing sites.

8.2 OFFLINE

Customers try to learn about the ways they get cheated from various resources viz., books, other people etc.,

Identify strong TR & EM

4. REQUIREMENT ANALYSIS:

A.FUNCTIONAL REQUIREMENTS:

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Gmail ,Apple Registration through Facebook , Instagram
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	Website identification	model identifies the legitimacy website based on trained data sets
FR-4	Classifier	By use of machine learning algorithms such as KNN,regression ,classification predicts the expected result
FR-5	Results	Model predicts the webpage and pop-out to the user before entering any confidential information

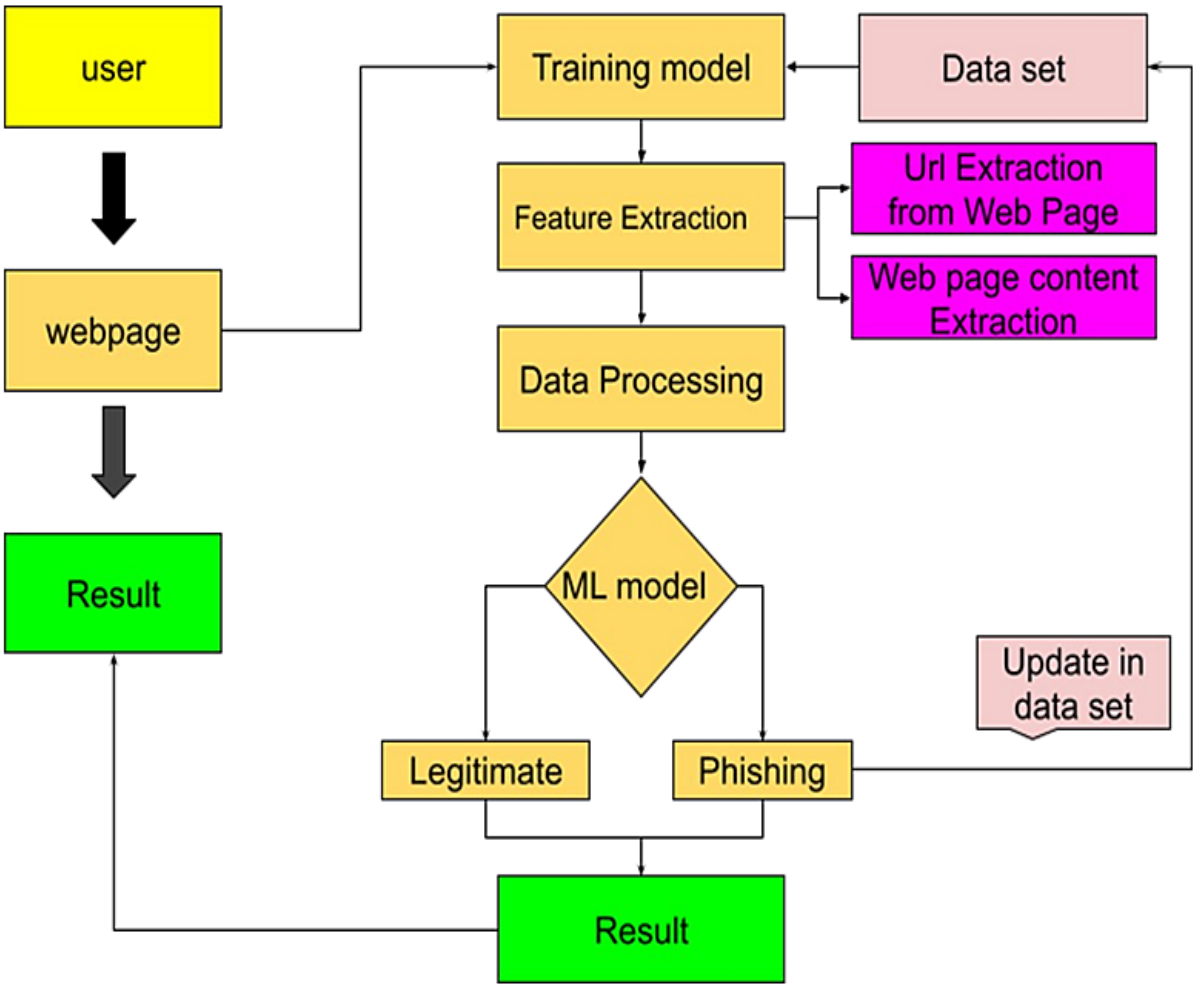
B.NON-FUNCTIONAL REQUIREMENTS:

FR NO.	Non-Functional Requirement	Description
NFR-1	Usability	with special feature web extension, it increases the effectiveness, efficiency, hassle-free navigation, overall satisfaction of the userthroughout the system
NFR-2	Security	Multi factor authentication, authorization, authentication of result
NFR-3	Reliability	Probability of failure-free operations in a specified environment for a specified time
NFR-4	Performance	The performance should be faster and user friendly for the effective performance
NFR-5	Availability	The user should get availability to access the resource must be valid and reliable
NFR-6	Scalability	System must be highly scalable in order to handling more users without any disturbance to service

5.PROJECT DESIGN:

A.DATA FLOW DIAGRAM:

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the lightamount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.



B.Solution & Technical Architecture:

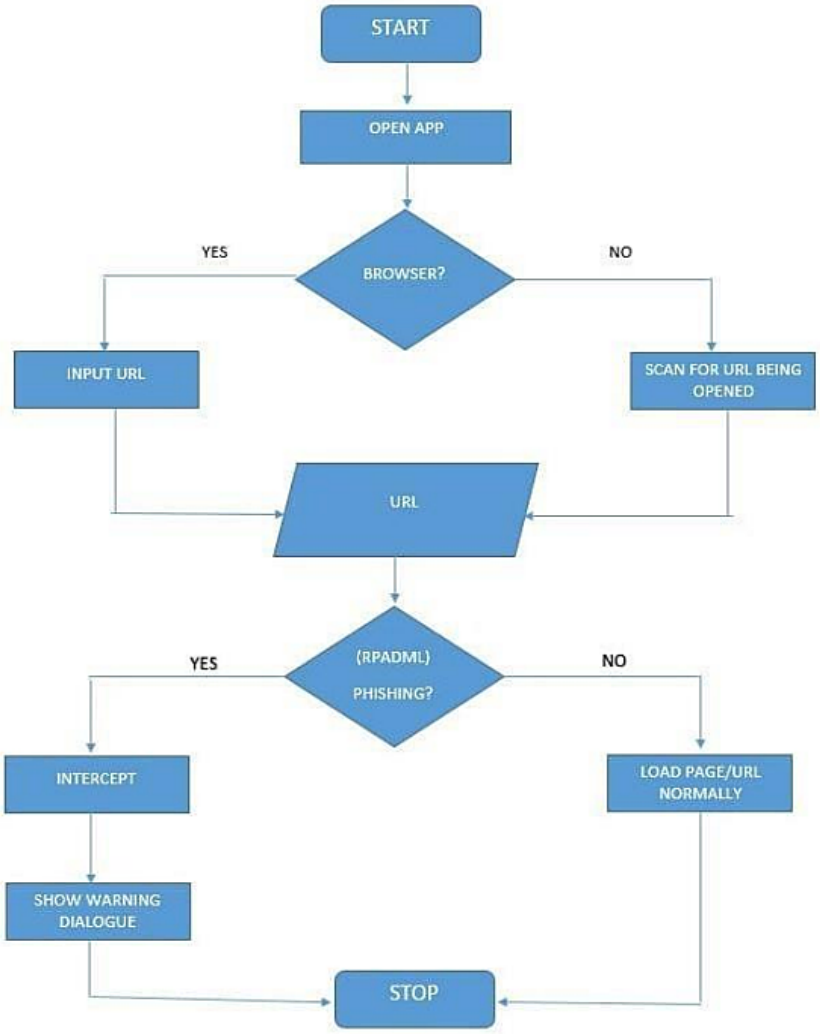


Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	How user interacts with application e.g. Web UI, Mobile App, Chatbot etc.	HTML, CSS, JavaScript / Angular Js / etc.
2.	Application Logic-1	Logic for a process in the application	Python
3.	Application Logic-2	Logic for a process in the application	IBM Watson STT service
4.	Application Logic-3	Logic for a process in the application	IBM Watson Assistant
5.	Database	Data Type, Configurations etc.	MySQL,
6.	Cloud Database	Database Service on Cloud	IBM DB2, IBM Cloudant etc.
7.	File Storage	File storage requirements	IBM Block Storage
8.	External API-1	Purpose of External API used in the application	Fast API
9.	External API-2	Purpose of External API used in the application	nil
10.	Machine Learning Model	Purpose of Machine Learning Model	Object Recognition Model, DBN model , Random forest classifier
11.	Infrastructure (Server / Cloud)	Application Deployment on a machine to monitor and detection of web phishing	Local, Cloud Foundry, Kubernetes, IBM watson

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	open-source frameworks used in the project	Gophish , python flask
2. ,	Security Implementations	security / access controls implemented, use of firewalls etc.	RSA , SHA-256, Encryptions, proxy firewalls , OWASP etc.
3.	Scalable Architecture	Cloud infrastructure which can be used to provide services for more number of custumers at any time	IBM Watson cloud

C.User Stories

User Stories

Use the below template to list all the user stories for the product.

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user)	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirmingmy password.	I can access my account / dashboard	High	Sprint-1
		USN-2	As a user, I will receive confirmation email once I have registered for the application	I can receive confirmation email & click confirm	High	Sprint-1
		USN-3	As a user, I can register for the application through Facebook	I can register & access the dashboard with Facebook Login	Low	Sprint-2
		USN-4	As a user, I can register for the application through Gmail		Medium	Sprint-1
	Login	USN-5	As a user, I can log into the application by entering email & password		High	Sprint-1
	Dashboard					
Customer (Web user)	User input	USN-1	As a user i can input the particular URL in the required field and waiting for validation.	I can go access the website without anyproblem	High	Sprint-1
Customer Care Executive	Feature extraction	USN-1	After i compare in case if none found on comparison then we can extract feature using heuristic and visual similarity approach.	As a User i can have comparison between websites for security.	High	Sprint-1
Administrator	Prediction	USN-1	Here the Model will predict the URL websites using Machine Learning algorithms such as Logistic Regression, KNN	In this i can have correct prediction on the particular algorithms	High	Sprint-1
	Classifier	USN-2	Here i will send all the model output to classifier in order to produce final result.	I this i will find the correct classifier for producing the result	Medium	Sprint-2

6.PROJECT PLANNING & SCHEDULING:

a. SPRINT PLANNING&ESTIMINATION:

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022	20	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	20	05 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	12 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	12 Nov 2022

Velocity:
Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

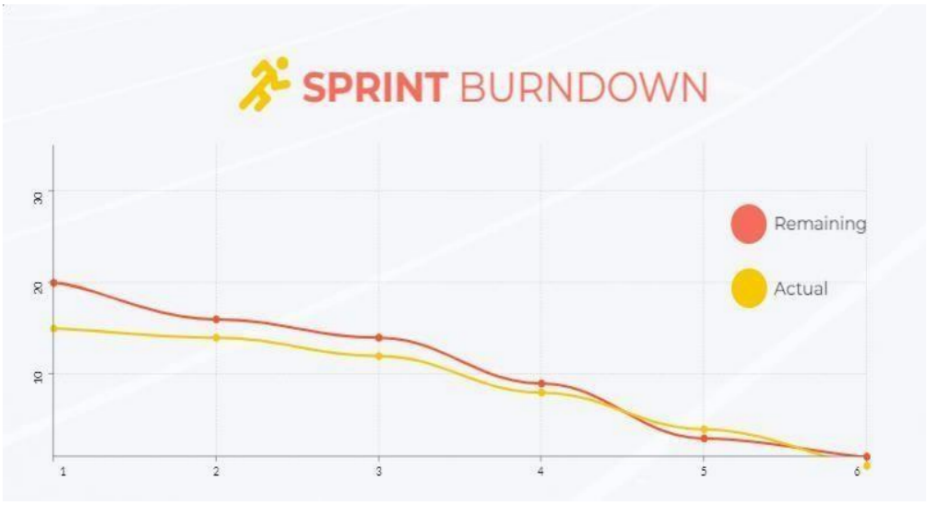
$$AV = \frac{sprint\ duration}{velocity} = \frac{20}{10} = 2$$

We have a 6-day sprint duration, and the velocity of the team is 20 (points per sprint). So our team's average velocity (AV) per iteration unit (story points per day)

AV = (Sprint Duration / Velocity) = 20 /6 = 3.33

Burndown Chart:

A burn down chart is a graphical representation of work left to do versus time. It is often used in agile software development methodologies such as Scrum. However, burn down charts can be applied to any project containing measurable progress over time.



B.SPRINT DELIVERYSCHEDULE:

Product backlog and sprint schedule:

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	User input	USN-1	User inputs an URL in the required field to check its validation.	5	Medium	Moorthy k
Sprint-1	Website Comparison	USN-2	Model compares the websites using Blacklist and Whitelist approach.	10	High	Sudharsan KT
Sprint-1	Storage	USN-3	Storing the Blacklisted websites in Database using IBM Cloud.	15	High	Jaiprasanth R
Sprint-2	Feature Extraction	USN-4	After comparison, if none found on comparison then it extract feature using heuristic and visual similarity.	10	High	Thahin khan IN
Sprint-2	Prediction	USN-5	Model predicts the URL using Machine learning algorithms such as logistic Regression, MLP.	10	Medium	Jaiprasanth R
Sprint-2	Accuracy Test	USN-6	Selecting the best accurate model and to process further steps.	15	High	Moorthy k
Sprint-3	Classifier	USN-7	Model sends all the output to the classifier and produces the final result.	5	Medium	Sudharsan KT
Sprint-3	Hosting	USN-8	Setting Up the Application and hosting in IBM cloud	10	Medium	Moorthy k
Sprint-4	Announcement	USN-9	Model then displays whether the website is legal site or a phishing site.	15	High	Thahin khan IN
Sprint-4	Events	USN-10	This model needs the capability of retrieving and displaying accurate result for a website.	10	High	Sudharsan KT

7.CODING & SOLUTIONING:

FEATURE 1:

The most critical componentof defense againstphishing is accurate detection of phishing websitesin a timely manner. Successful recognition and blacklisting of phishing URLs would result in end users receivinga warning while being deceived tovisit the phishingsite. Once a striking warning such as the one presented is displayed, it is highly likely that users would decline the login/data-input requests or malicious payload-downloading popups in phishing sites.

FEATURE 2:

Hence, in this we propose an effective detectionsystem that crawls websites and automatically discoversmalicious pages. We intend our system to be used by ablacklist provider who can automatically compile and maintain an up-to-date blacklist of malicious URLs. Our system is equipped with a plentiful set of featuresthat reflect various types of essential characteristics of the webpagecontent or behavior, which are impossible or difficult to be camouflaged by the miscreants.

This system can proactively crawl and evaluate a given URL, labeling it to be phishing/malicious or legitimate, based on a trained classifier. Further, crawling isdone from distributed vantagepoints, which allows the system to collect novel featuresand achieve higher accuracy and quicker recognition speed. By avoidingmanual analysis, the blacklist can achieve better coverage and timeliness.

Source code

App.py

```
#importing requiredlibraries


from flask importFlask, request, render_templateimport
numpy as np
import pandas as pd
from sklearn import metrics
importwarnings
import pickle
warnings.filterwarnings('ignore')
from feature importFeatureExtraction

file = open("model.pkl","rb")gbc
= pickle.load(file) file.close()



app = Flask(_name_)

@app.route("/", methods=["GET", "POST"])def
index():
    if request.method == "POST":

        url = request.form["url"] obj =
        FeatureExtraction(url)
        x = np.array(obj.getFeaturesList()).reshape(1,30)


        y_pred=gbc.predict(x)[0]#1 is
        safe
        #-1 is unsafe
        y_pro_phishing = gbc.predict_proba(x)[0,0]
        y_pro_non_phishing = gbc.predict_proba(x)[0,1]#
        if(y_pred ==1 ):
        pred = "Itis {0:.2f} % safe to go ".format(y_pro_phishing*100)
```

```
                                                    return  render_template('index.html',xx
        =round(y_pro_non_phishing,2),url=url  )
            return render_template("index.html", xx =-1)


        if__name__== "_main_":
            app.run(debug=True,port=2002)
```

Feature.py

```
 import ipaddress
import re
import  urllib.request
from bs4 import BeautifulSoup
importsocket
import requests
fromgooglesearch  import
searchimport whois
from datetime importdate, datetime
importtime
from dateutil.parser import parse as date_parsefrom
urllib.parse import urlparse


class FeatureExtraction:
    features = []
    def__init_(self,url):
        self.features = []self.url =
        url self.domain = ""
        self.whois_response = ""
        self.urlparse = ""
        self.response = "" self.soup
        = ""


        try:
            self.response = requests.get(url)
```

```
        self.soup = BeautifulSoup(response.text, 'html.parser')except:
        pass

    try:
        self.urlparse = urlparse(url)
        self.domain = self.urlparse.netloc
     except:
        pass

    try:
        self.whois_response = whois.whois(self.domain)
     except:
        pass




    self.features.append(self.UsingIp())
    self.features.append(self.longUrl())
    self.features.append(self.shortUrl())
    self.features.append(self.symbol())
    self.features.append(self.redirecting())
    self.features.append(self.prefixSuffix())
    self.features.append(self.SubDomains())
    self.features.append(self.Hppts())
    self.features.append(self.DomainRegLen())
    self.features.append(self.Favicon())

    self.features.append(self.NonStdPort()) self.features.append(self.HTTPSDomainURL())
    self.features.append(self.RequestURL()) self.features.append(self.AnchorURL())
    self.features.append(self.LinksInScriptTags())
    self.features.append(self.ServerFormHandler())self.features.append(self.InfoEmail())
    self.features.append(self.AbnormalURL())
```

```
        self.features.append(self.WebsiteForwarding())
        self.features.append(self.StatusBarCust())

        self.features.append(self.DisableRightClick())
        self.features.append(self.UsingPopupWindow())
        self.features.append(self.IframeRedirection())
        self.features.append(self.AgeofDomain()) self.features.append(self.DNSRecording())
        self.features.append(self.WebsiteTraffic()) self.features.append(self.PageRank())
        self.features.append(self.GoogleIndex())
        self.features.append(self.LinksPointingToPage())




        self.features.append(self.StatsReport())



    # 1.UsingIp
    def UsingIp(self):
        try:
            ipaddress.ip_address(self.url)
            return-1
        except:
            return 1

    # 2.longUrl
    def  longUrl(self):
        if len(self.url) < 54:
            return 1
        if len(self.url) >=54 and len(self.url) <= 75:return 0
        return -1
```

```
    # 3.shortUrl
    def shortUrl(self):
        match = re.search('bit\.ly|goo\.gl|shorte\.st|go2l\.ink|x\.co|ow\.ly|t\.co|tinyurl|
tr\.im|is\.gd|cli\.gs|'
                          'yfrog\.com|migre\.me|ff\.im|tiny\.cc|url4\.eu|twit\.ac|su\.pr|twurl\.nl|
snipurl\.com|'
                      'short\.to|BudURL\.com|ping\.fm|post\.ly|Just\.as|bkite\.com|snipr\.com|
fic\.kr|loopt\.us|'
                       'doiop\.com|short\.ie|kl\.am|wp\.me|rubyurl\.com|om\.ly|to\.ly|bit\.do|

t\.co|lnkd\.in|'ity\.im|'


'db\.tt|qr\.ae|adf\.ly|goo\.gl|bitly\.com|cur\.lv|tinyurl\.com|ow\.ly|bit\.ly|

'q\.gs|is\.gd|po\.st|bc\.vc|twitthis\.com|u\.to|j\.mp|buzurl\.com|cutt\.us|

 u\.bb|yourls\.org|'
                          'x\.co|prettylinkpro\.com|scrnch\.me|filoops\.info|vzturl\.com|qr\.net|
1url\.com|tweez\.me|v\.gd|tr\.im|link\.zip\.net',self.url)
        if match:
            return -1
        return 1


    # 4.Symbol@ def
    symbol(self):
        if  re.findall("@",self.url):return -
            1
        return 1
    # 5.Redirecting// def
    redirecting(self):
        if self.url.rfind('//')>6:
```

```
            return -1
        return 1
    # 6.prefixSuffix
    def prefixSuffix(self):
        try:
            match= re.findall('\-', self.domain)if
            match:
                return -1
            return 1
        except:
            return -1
    # 7.SubDomains
    def SubDomains(self):
        dot_count = len(re.findall("\.", self.url))if
        dot_count== 1:
            return 1
        elif dot_count == 2:
            return0
        return -1


    # 8.HTTPS
    def Hppts(self):
        try:
            https =self.urlparse.schemeif
            'https' in https:
                return 1
            return -1
        except:
            return 1


    # 9.DomainRegLen
    def DomainRegLen(self):
```

```
        try:
            expiration_date = self.whois_response.expiration_date
            creation_date = self.whois_response.creation_date try:
                if(len(expiration_date)): expiration_date =
                    expiration_date[0]
            except:
                pass
            try:
                if(len(creation_date)): creation_date =
                    creation_date[0]
             except:
                pass

                                        age    =    (expiration_date.year-creation_date.year)*12+
(expiration_date.month-creation_date.month)
              if age >=12:
                 return 1
            return -1
        except:
            return -1


    # 10. Favicon def
    Favicon(self):
        try:
            for head in self.soup.find_all('head'):
                for head.link in self.soup.find_all('link', href=True):
                    dots = [x.start(0) for x in re.finditer('\.', head.link['href'])]
                                if self.url in head.link['href'] or len(dots) == 1 or domain in
head.link['href']:
                        return 1
            return -1
        except:
```

```
        return -1


    # 11. NonStdPort def
    NonStdPort(self):
        try:
            port = self.domain.split(":")if
            len(port)>1:
                return -1
            return 1
        except:
            return -1


    # 12. HTTPSDomainURL
    def HTTPSDomainURL(self):
        try:
            if 'https' in self.domain:
                return -1
            return 1
        except:
            return -1
    # 13. RequestURL def
    RequestURL(self):
        try:
            for img in self.soup.find_all('img', src=True):
                dots = [x.start(0) for x in re.finditer('\.', img['src'])]
                if self.url in img['src'] or self.domain in img['src'] or len(dots) == 1:success =
                    success+ 1
                i = i+1


            for audio in self.soup.find_all('audio', src=True):
                dots = [x.start(0) for x in re.finditer('\.', audio['src'])]
                if self.url in audio['src'] or self.domain in audio['src'] or len(dots) == 1:success =
```

```
                success+ 1
            i = i+1


        for embed in self.soup.find_all('embed', src=True):
            dots = [x.start(0) for x in re.finditer('\.', embed['src'])]
            if self.url in embed['src'] or self.domain in embed['src'] or len(dots) == 1:success =
                success+ 1
            i = i+1


        for iframe in self.soup.find_all('iframe', src=True):
            dots = [x.start(0) for x in re.finditer('\.', iframe['src'])]
            if self.url in iframe['src'] or self.domain in iframe['src'] or len(dots) == 1:success =
                success+ 1
            i = i+1


        try:
            percentage = success/float(i) * 100if
            percentage < 22.0:
                return 1
            elif((percentage >= 22.0) and (percentage < 61.0)):return 0
            else:
                return -1
        except:
            return 0
    except:
        return -1
# 14. AnchorURL def
AnchorURL(self):
    try:
        i,unsafe = 0,0
        for a in self.soup.find_all('a', href=True):
                    if "#" in a['href'] or "javascript" in a['href'].lower() or "mailto" in
```

```
a['href'].lower() or not (url in a['href']or self.domain in a['href']):
                    unsafe = unsafe+ 1
                i = i + 1


            try:
                percentage = unsafe / float(i) * 100if
                percentage < 31.0:
                    return 1
                elif ((percentage >= 31.0) and (percentage < 67.0)):return 0
                else:
                    return -1
            except:
                return -1


        except:
            return -1


    # 15. LinksInScriptTags def
    LinksInScriptTags(self):
        try:
            i,success = 0,0
            for link in self.soup.find_all('link', href=True):
                dots = [x.start(0) for x in re.finditer('\.', link['href'])]
                if self.url in link['href'] or self.domain in link['href'] or len(dots) == 1:success =
                    success+ 1
                i = i+1


            for script in self.soup.find_all('script', src=True):
                dots = [x.start(0) for x in re.finditer('\.', script['src'])]
                if self.url in script['src'] or self.domain in script['src'] or len(dots) == 1:success =
                    success+ 1
                i = i+1
```

```
        try:
            percentage = success / float(i) * 100if
            percentage < 17.0:
                return 1
            elif((percentage >= 17.0) and (percentage < 81.0)):return 0
            else:
                return -1
        except:
            return 0
    except:
        return -1

# 16. ServerFormHandler def
ServerFormHandler(self):
    try:
        if len(self.soup.find_all('form',action=True))==0:return 1
        else :
            for form in self.soup.find_all('form', action=True):
                if form['action'] == "" or form['action'] == "about:blank":return -1
                elif self.url not in form['action'] and self.domain not in form['action']:return
                    0
                else:
                    return 1
    except:
        return -1

# 17. InfoEmail def
InfoEmail(self):
    try:
        if re.findall(r"[mail\(\)|mailto:?]", self.soap):
            return -1
```

```
        else:
            return 1
    except:
        return -1

# 18. AbnormalURL
def AbnormalURL(self):try:
        if self.response.text == self.whois_response:return 1
        else:
            return -1
    except:
        return -1

# 19. WebsiteForwarding def
WebsiteForwarding(self):
    try:
        if len(self.response.history) <=1:
            return 1
        elif len(self.response.history) <= 4:
            return0
        else:
            return -1
    except:
         return -1

# 20. StatusBarCustdef
StatusBarCust(self):
    try:
        if re.findall("<script>.+onmouseover.+</script>", self.response.text): return 1
        else:
            return -1
    except:
         return -1
```

```
# 21. DisableRightClick def
DisableRightClick(self):
    try:
        if re.findall(r"event.button?== ?2", self.response.text):return 1
        else:
            return -1
    except:
         return -1

# 22. UsingPopupWindow def
UsingPopupWindow(self):
    try:
        if re.findall(r"alert\(", self.response.text):
            return1
        else:
            return -1
    except:
         return -1

# 23. IframeRedirection def
IframeRedirection(self):
    try:
        if re.findall(r"[<iframe>|<frameBorder>]", self.response.text):return1
        else:
            return -1
    except:
         return -1

# 24. AgeofDomain def
AgeofDomain(self):
    try:
```

```
            creation_date = self.whois_response.creation_datetry:
                if(len(creation_date)): creation_date =
                    creation_date[0]
             except:
                pass

            today  = date.today()
                                age    =    (today.year-creation_date.year)*12+(today.month-
creation_date.month)
                if age >=6:
                    return 1
            return -1
        except:
            return -1

    # 25. DNSRecording def
    DNSRecording(self):
        try:
            creation_date = self.whois_response.creation_datetry:
                if(len(creation_date)): creation_date =
                    creation_date[0]
             except:
                pass

            today  = date.today()
                                age    =    (today.year-creation_date.year)*12+(today.month-
creation_date.month)
                if age >=6:
                    return 1
            return -1
        except:
            return -1
```

```
    # 26. WebsiteTraffic def
    WebsiteTraffic(self):
        try:
                rank = BeautifulSoup(urllib.request.urlopen("http://data.alexa.com/data?
cli=10&dat=s&url=" + url).read(), "xml").find("REACH")['RANK']
            if (int(rank) <
                100000):return 1
            return 0
        except:
            return -1

    # 27. PageRank def
    PageRank(self):
        try:
                                                        prank_checker_response
                                                        =
requests.post("https://www.checkpagerank.net/index.php", {"name": self.domain})

                                    global_rank    =    int(re.findall(r"Global
Rank:                               ([0-9]+)",rank_checker_response.text)[0])
            if global_rank > 0 and global_rank < 100000:return 1
            return -1
        except:
            return -1

    # 28. GoogleIndex def
    GoogleIndex(self):
        try:
            site = search(self.url, 5)if
            site:
                return 1
```

```
            else:
                return -1
        except:
            return 1


    # 29. LinksPointingToPage def
    LinksPointingToPage(self):
        try:
            number_of_links = len(re.findall(r"<a href=", self.response.text))if
            number_of_links == 0:
                return 1
            elif number_of_links <=2:
                return 0
            else:
                return -1
        except:
            return -1


    # 30. StatsReport def
    StatsReport(self):
        try:
            url_match = re.search(
          'at\.ua|usa\.cc|baltazarpresentes\.com\.br|pe\.hu|esy\.es|hol\.es|sweddy\.com|
myjino\.ru|96\.lt|ow\.ly', url)
            ip_address = socket.gethostbyname(self.domain)
                                ip_match = re.search('146\.112\.61\.108|213\.174\.157\.151|
121\.50\.168\.88|192\.185\.217\.116|78\.46\.211\.158|181\.174\.165\.13|
46\.242\.145\.103|121\.50\.168\.40|83\.125\.22\.219|46\.242\.145\.98|'
                                            '107\.151\.148\.44|107\.151\.148\.107|64\.70\.19\.203|
199\.184\.144\.27|107\.151\.148\.108|107\.151\.148\.109|119\.28\.52\.61|
54\.83\.43\.69|52\.69\.166\.231|216\.58\.192\.225|'
                                                    '118\.184\.25\.86|67\.208\.74\.71|23\.253\.126\.58|
104\.239\.157\.210|175\.126\.123\.219|141\.8\.224\.221|10\.10\.10\.10|
```

```
43\.229\.108\.32|103\.232\.215\.140|69\.172\.201\.153|'
                                    '216\.218\.185\.162|54\.225\.104\.146|103\.243\.24\.98|
199\.59\.243\.120|31\.170\.160\.61|213\.19\.128\.77|62\.113\.226\.131|
208\.100\.26\.234|195\.16\.127\.102|195\.16\.127\.157|'
                                        '34\.196\.13\.28|103\.224\.212\.222|172\.217\.4\.225|
54\.72\.9\.51|192\.64\.147\.141|198\.200\.56\.183|23\.253\.164\.103|
52\.48\.191\.26|52\.214\.197\.72|87\.98\.255\.18|209\.99\.17\.27|'
                                            '216\.38\.62\.18|104\.130\.124\.96|47\.89\.58\.141|
78\.46\.211\.158|54\.86\.225\.156|54\.82\.156\.19|37\.157\.192\.102|
204\.11\.56\.48|110\.34\.231\.42', ip_address)if
            url_match:
                return -1
            elif ip_match:
                return -1
            return 1
        except:
            return 1
    def getFeaturesList(self):
        returnself.features
```

Integration.py

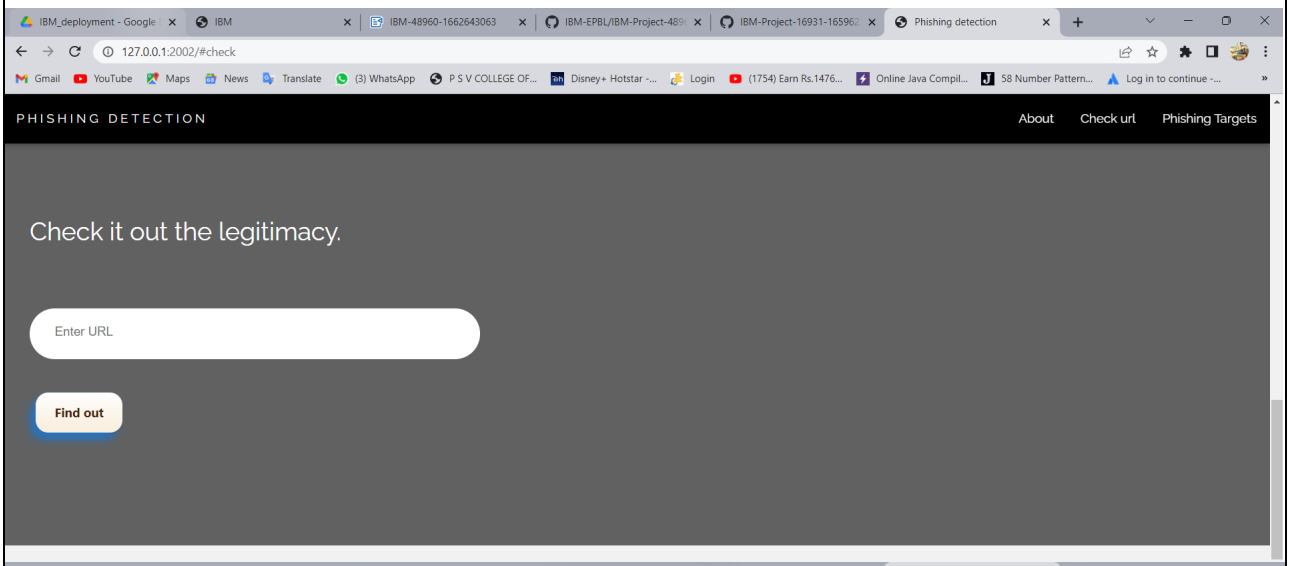
```
        #importing required libraries


        from flask importFlask, request, render_templateimport
        numpy as np
        import pandas as pd
        from sklearn import metrics
        importwarnings
        import pickle
        import requests
        warnings.filterwarnings('ignore')
        from feature importFeatureExtraction
```

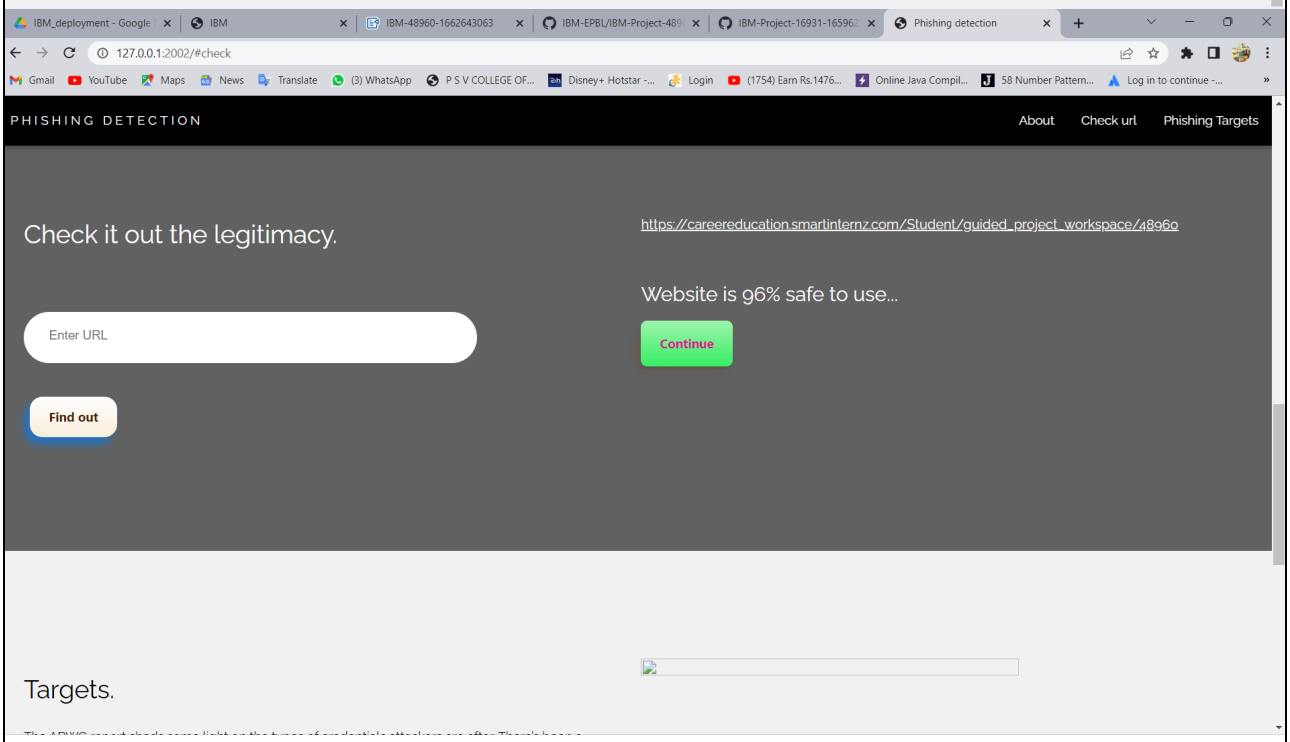
```
file = open("model.pkl","rb")gbc
= pickle.load(file) file.close()

# NOTE:you must manually set API_KEY below using information retrievedfrom your
IBM Cloud account.
API_KEY = "H_eQnWI4923bdKM63m1wH9G07eo-uRpUYs9b7FqNPCVF"
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.route("/", methods=["GET", "POST"])def
index():
    if request.method == "POST":

        url = request.form["url"] obj =
        FeatureExtraction(url)
        x = np.array(obj.getFeaturesList()).reshape(1,30)


        y_pred=gbc.predict(x)[0]#1 is
        safe
        #-1 is unsafe
        y_pro_phishing = gbc.predict_proba(x)[0,0]
        y_pro_non_phishing = gbc.predict_proba(x)[0,1]#
        if(y_pred ==1 ):
        pred = "Itis {0:.2f} % safe to go ".format(y_pro_phishing*100)
```

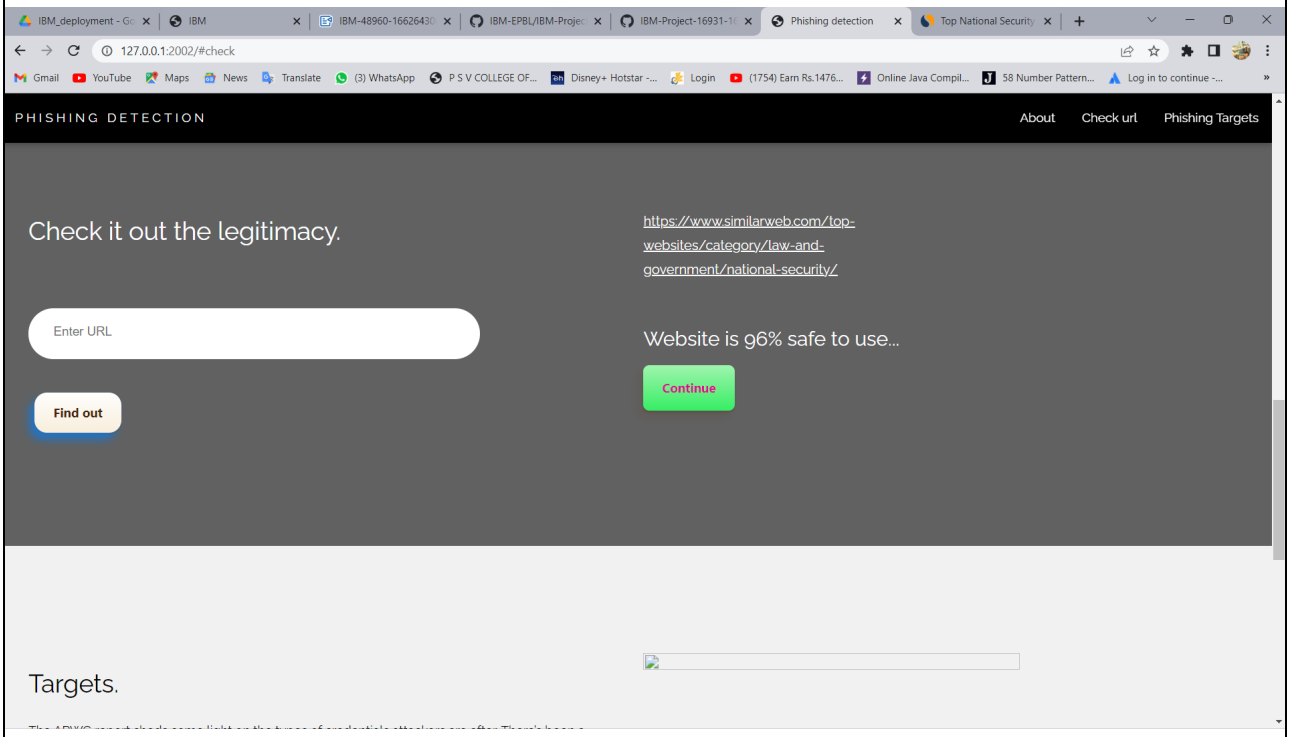
```
payload_scoring =
{"input_data": [{"field":
[["UsingIP","LongURL","ShortURL","Symbol@","Redirecting//","PrefixSuffix-","
SubDomains","HTTPS","DomainRegLen","Favicon","NonStdPort","HTTPSDoma
inURL","RequestURL","AnchorURL","LinksInScriptTags","ServerFormHandler","
InfoEmail","AbnormalURL","WebsiteForwarding","StatusBarCust","DisableRigh
tClick","UsingPopupWindow","IframeRedirection","AgeofDomain","DNSRecord
ing","WebsiteTraffic","PageRank","GoogleIndex","LinksPointingToPage","StatsReport"
]], "values": [[1,1,1,1,1,-1,-1,-1,-1,1,1,1,1,1,-1,-1,1,1,1,1,0,1,1,1,1,-1,-1,-1,-
1,1,0,1]]}]}

response_scoring
=requests.post('https://us-south.ml.cloud.ibm.com/ml/v4/deployments/ 73df506a-
fc05-42ee-848a-ee6d13e9c4ac/predictions?version=2022-11-17', json=payload_scoring,
    headers={'Authorization': 'Bearer ' + mltoken})
    print("Scoring response")
    predictions=response_scoring.json()
#print(predictions)
    pred=print(predictions['predictions'][0]['values'][0][0])
                return render_template('index.html',xx
=round(y_pro_non_phishing,2),url=url )
  return render_template("index.html", xx =-1
if__name__== "_main_":
  app.run(debug=True,port=2020
```

8.TESTING

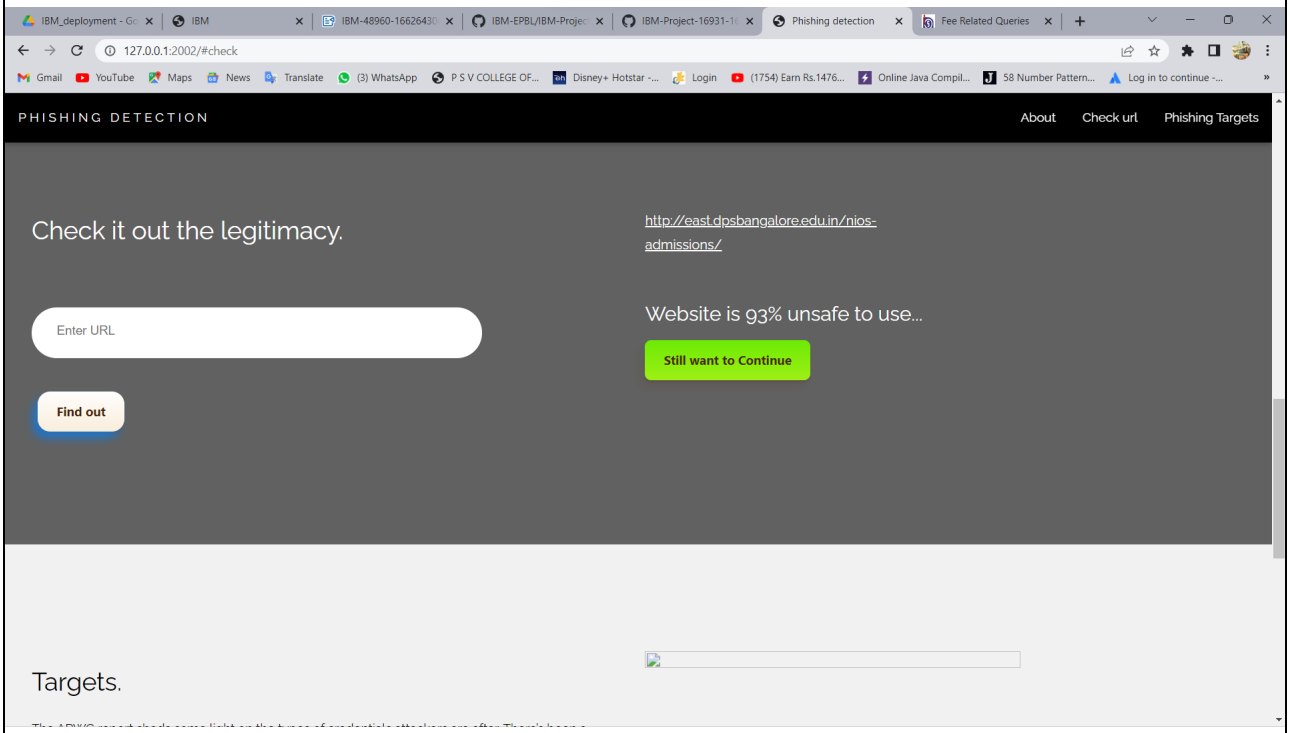
a.Test case 1:url detection for legitimate website

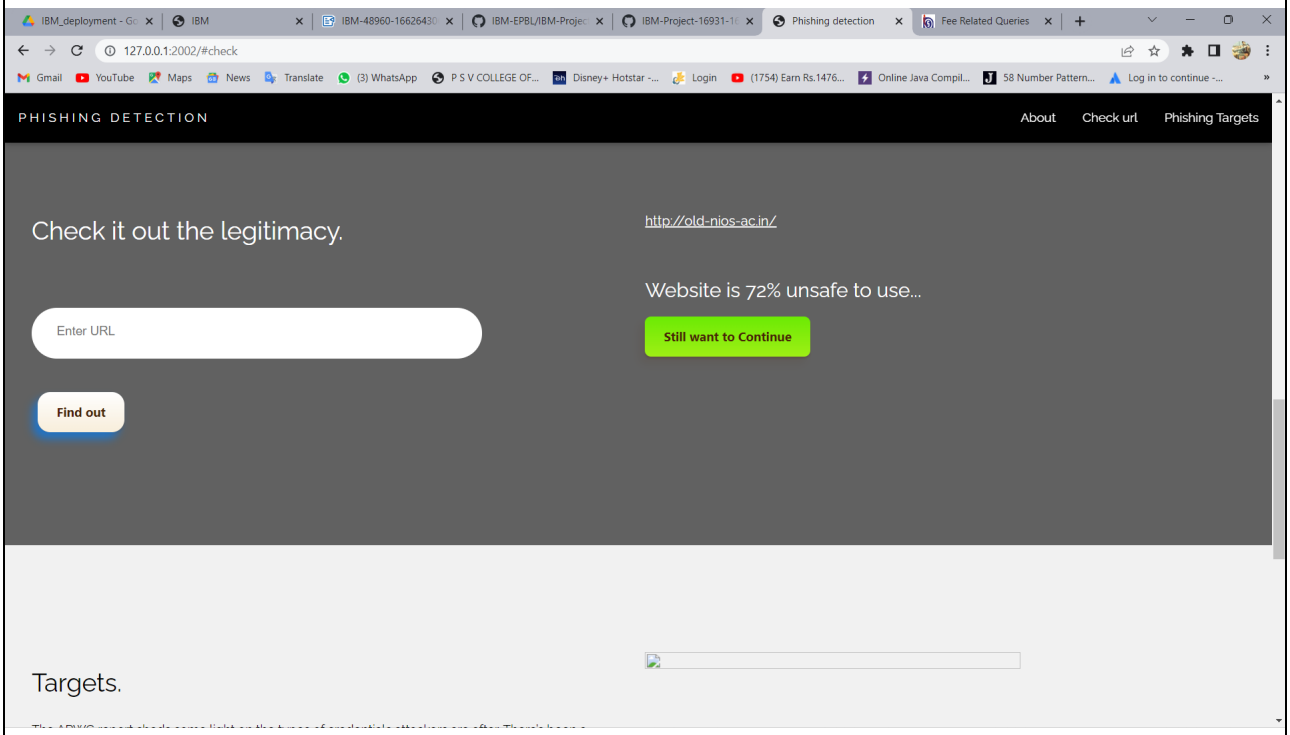

IBM_deployment - Google
IBM
IBM-48960-1662643063
IBM-EPBL/IBM-Project-489
IBM-Project-16931-165962
Phishing detection
127.0.0.1:2002/#check
Gmail
YouTube
Maps
News
Translate
(3) WhatsApp
P S V COLLEGE OF...
Disney+ Hotstar -...
Login
(1754) Earn Rs.1476...
Online Java Compil...
58 Number Pattern...
Log in to continue -...
PHISHING DETECTION
About
Check url
Phishing Targets
Check it out the legitimacy.
Enter URL
Find out


IBM_deployment - Google
IBM
IBM-48960-1662643063
IBM-EPBL/IBM-Project-489
IBM-Project-16931-165962
Phishing detection
127.0.0.1:2002/#check
Gmail
YouTube
Maps
News
Translate
(3) WhatsApp
P S V COLLEGE OF...
Disney+ Hotstar -...
Login
(1754) Earn Rs.1476...
Online Java Compil...
58 Number Pattern...
Log in to continue -...
PHISHING DETECTION
About
Check url
Phishing Targets
Check it out the legitimacy.
Enter URL
Find out
https://careereducation.smartinternz.com/Student/guided_project_workspace/48960
Website is 96% safe to use...
Continue
Targets.



Test case 2: detecting phishing website:


PHISHING DETECTION
About
Check url
Phishing Targets
Check it out the legitimacy.
Enter URL
Find out
http://east.dpsbangalore.edu.in/nios-admissions/
Website is 93% unsafe to use...
Still want to Continue
Targets.


PHISHING DETECTION
About
Check url
Phishing Targets
Check it out the legitimacy.
Enter URL
Find out
http://old-nios-ac.in/
Website is 72% unsafe to use...
Still want to Continue
Targets.

B.User Acceptance Testing:

1. Purpose of Document

The purpose of this document is to briefly explain the test coverage and open issues of the [Web phishing detection] project at the time of the release to User Acceptance Testing (UAT).

2. Defect Analysis

This report shows the number of resolved or closed bugs at each severity level, and how they were resolved

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	10	4	2	3	21
Duplicate	0	0	3	2	5
External	1	3	1	0	5
Fixed	10	2	3	15	30
Not Reproduced	0	0	2	1	3
Skipped	0	0	0	0	0
Won't Fix	0	0	2	1	3
Totals	21	9	15	22	67

3. Test Case Analysis

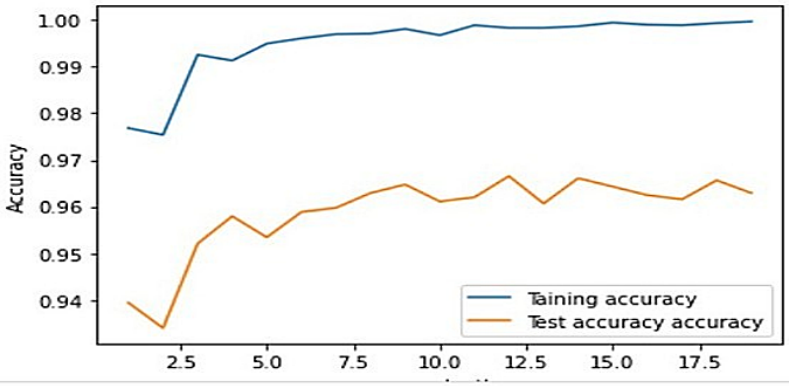
This report shows the number of test cases that have passed, failed, and untested

Section	Total Cases	Not Tested	Fail	Pass
Print Engine	15	0	0	15
Client Application	40	0	0	40
Security	7	0	0	7
Outsource Shipping	3	0	0	3
Exception Reporting	12	0	0	12
Final Report Output	12	0	0	12
Version Control	5	0	0	5

9.RESULT

a.PERFORMANCE

```
training_accuracy=[]
test_accuracy=[]
depth=range(1,20)
for n in depth:
  rf_test=RandomForestClassifier(n_estimators=n)
  rf_test.fit(x_train,y_train)
  training_accuracy.append(rf_test.score(x_train,y_train))
  test_accuracy.append(rf_test.score(x_test,y_test))
plt.figure(figsize=None)
plt.plot(depth,training_accuracy,label="Taining accuracy")
plt.plot(depth,test_accuracy,label="Test accuracy accuracy")
plt.ylabel("Accuracy")
plt.xlabel("max_depth")
plt.legend();
```



B.METRICS:

Classification report

[ ]

	ML Model	Accuracy	f1_score	Recall	Precision
0	Logistic Regression	91.814	92.567	94.496	94.496
1	Random Forest	96.653	96.942	100.000	100.000
2	XgbClassifier	94.754	95.207	96.714	96.714
3	Decision tree	95.206	95.605	100.000	100.000

[ ]
```
sorted_result=result.sort_values(by=['Accuracy', 'f1_score'],ascending=False).reset_index(drop=True)
sorted_result
```

	ML Model	Accuracy	f1_score	Recall	Precision
0	Random Forest	96.653	96.942	100.000	100.000
1	Decision tree	95.206	95.605	100.000	100.000
2	XgbClassifier	94.754	95.207	96.714	96.714
3	Logistic Regression	91.814	92.567	94.496	94.496

10.ADVANTAGES :

Bayesian content filtering can be trained on a per user basis.It avoids the falsepositives.

DISADVANTAGES:

Scammers use “Bayesian poisoning” technique to circumvent Bayesian content filtering.phishers sometimes bypass the filter’s databaseby transforming the words.For example, they may replace“Viagra” with “Viaagra.”

11. CONCLUSION:

Phishing URL detection plays a pivotal role for many cybersecurity software and applications. In this , we reviewed works based on the advanced machine learning techniques and approaches that promise a fresh approach in this domain. This includes summary of the reviewed works after a systematic and comprehensive study on PhishingWebsite Detection systems.We believe thatthe presented survey would help researchers and developers with the insight of the progress achieved in the past years. Despite the tremendous progress in the field of cybersecurity, phishing website detectionstill pose a challenging problem with the ever evolving technology and techniques.

12.FUTURE SCOPE:

The success of these techniques highly depends on the quality and combination of relevant characteristic features of web pages which may include network traffic information, content characteristics, lexicalfeatures of URLs, and even domain name system (DNS) information. However,extracting these attributes may be costly and sometimesrequire downloading complete web pages [9] or looking up various DNS servers and ISPs to get enrichment data like geo-location, registration records, and network information , which face the problem of network latency, making them impractical for real-time systems. Due to the difficulties of using non-lexical features to detect malicious URLs in real-time despite their high accuracy values, previous works have exploredthe use of URL lexicalfeatures only and it hasbeen proven that URL features alone can produce an accurate means of detectingmalicious webpage in realtime systems.

13. APPENDIX

Source code:https://github.com/IBM-EPBL/IBM-Project-48960-1666076719

Project Demo Link:https://drive.google.com/file/d/1ZSeL3o1VJldB-5ELSxkRFri6c-Pajik6/view?usp=share_link