Fake News Faux Real :
Lab 8

Login/SignUp Testing:

Code:

main.py

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```python
import pyrebase
from flask import Flask, flash, redirect, render_template, request, session, abort, url_for

app = Flask(__name__)       #Initialze flask constructor

#Add your own details
config = {
  "apiKey" : "AIzaSyDwU9M-A9KrdDNIbo6D_qi8wQdKE3RVTHg",
  "authDomain": "mypro-ce6df.firebaseapp.com",
  "projectId": "mypro-ce6df",
  "storageBucket": "mypro-ce6df.appspot.com",
  "messagingSenderId": "604651206875",
  "appId": "1:604651206875:web:eee1c4de5b8b4367fb34fe",
  "measurementId": "G-N5HDZTBFPH",
   "databaseURL" : ""
}

#initialize firebase
firebase = pyrebase.initialize_app(config)
auth = firebase.auth()
db = firebase.database()

#Initialze person as dictionary
person = {"is_logged_in": False, "name": "", "email": "", "uid": ""}

#Login
@app.route("/")
def login():
    return render_template("login.html")

#Sign up/ Register
@app.route("/signup")
def signup():
    return render_template("signup.html")
```

main.py

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```python
#Welcome page
@app.route("/welcome")
def welcome():
    if person["is_logged_in"] == True:
        return render_template("welcome.html", email = person["email"], name = person["name"])
    else:
        return redirect(url_for('login'))

#If someone clicks on login, they are redirected to /result
@app.route("/result", methods = ["POST", "GET"])
def result():
    unsuccessful = 'Please check your credentials'
    successsful = 'Login successful'
    if request.method == 'POST':
        email = request.form['email']
        password = request.form['pass']
        try:
            auth.sign_in_with_email_and_password(email, password)
            return render_template('welcome.html', s=successsful)
        except:
            return render_template('register.html', us=unsuccessful)
    return render_template('login.html')

#If someone clicks on register, they are redirected to /register
@app.route("/register", methods = ["POST", "GET"])
def register():
    if request.method == "POST":        #Only listen to POST
        result = request.form           #Get the data submitted
        email = result["email"]
        password = result["pass"]
        name = result["name"]
        try:
            #Try creating the user account using the provided data
            auth.create_user_with_email_and_password(email, password)
            #Login the user
            user = auth.sign_in_with_email_and_password(email, password)
            #Add data to global person
```

Run Testcases ⊗ 0 ⚠ 0 Live Share Ln 17, Col 22 Spaces: 4 UTF-8 CRLF Python 3.10.10 64-bit

main.py

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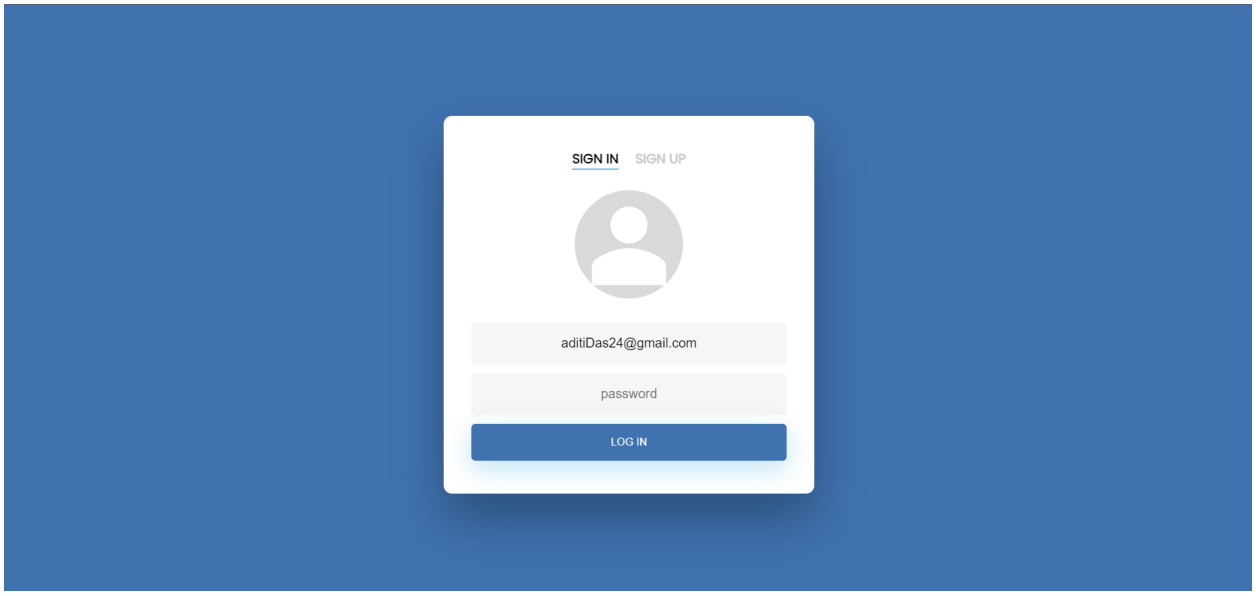
```python
            user = auth.sign_in_with_email_and_password(email, password)
            #Add data to global person
            global person
            person["is_logged_in"] = True
            person["email"] = user["email"]
            person["uid"] = user["localId"]
            person["name"] = name
            #Append data to the firebase realtime database
            data = {"name": name, "email": email}
            db.child("users").child(person["uid"]).set(data)
            #Go to welcome page
            return redirect(url_for('welcome'))
        except:
            #If there is any error, redirect to register
            return redirect(url_for('register'))

    else:
        if person["is_logged_in"] == True:
            return redirect(url_for('welcome'))
        else:
            return redirect(url_for('register'))

if __name__ == "__main__":
    app.run()
```

Run Testcases ⊗ 0 ⚠ 0 Live Share Ln 17, Col 22 Spaces: 4 UTF-8 CRLF Python 3.10.10 64-bit

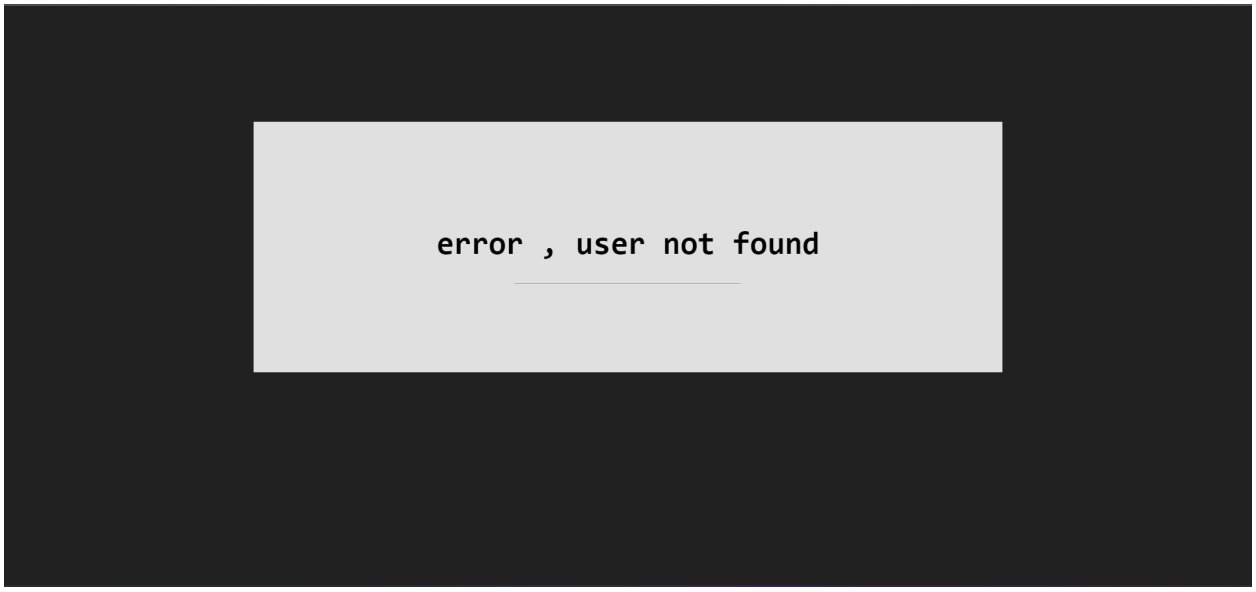
Output:



Testing:

a) We first tried logging in with a ID that was not registered:

Output:



b) We then tried signing up:

Output:

c) We then tried logging in with a registered username but wrong password

Output:

```
error , user not found
```

d) We finally logged in with the correct username and password

Output:

```
Hi,
```

Machine Learning Testing:

We ran three different algorithms to obtain the output in increasing order of accuracy

Code:

```
def testing(model,text):
    model.fit(X_train,y_train)
    y_pred=model.predict(X_test)
    class_report=classification_report(y_test,y_pred)
    print(class_report)
    print('----------------------------------------------------------------------')

    print("Accuracy: " + str( accuracy_score(y_test, y_pred)*100 ) + "%")
    print('\n')

    print('')
    print('Cross-validation scores with 5 folds:')
    print('')
    print(f"ROC AUC: {round(cross_val_score(model, X_train, y_train, cv = 5, scoring = 'roc_auc').mean(), 3)}")
    print(f"precision: {round(cross_val_score(model, X_train, y_train, cv = 5, scoring = 'precision').mean(), 2)}")
    print(f"recall: {round(cross_val_score(model, X_train, y_train, cv = 5, scoring = 'recall').mean(), 2)}")
    print(f"f1: {round(cross_val_score(model, X_train, y_train, cv = 5, scoring = 'f1').mean(), 2)}")

    auc = roc_auc_score(y_test, y_pred)
    print('Area under the ROC Curve for Testing Set is: ' + str(auc))


    print('----------------------------------------------------------------------')

    cm = confusion_matrix(y_test, y_pred)
    predicted_probab_log = model.predict_proba(X_test)
    predicted_probab_log = predicted_probab_log[:, 1]
    fpr, tpr, _ = roc_curve(y_test, predicted_probab_log)
    y_pred = model.predict(X)

    plot_confusion_matrix(y, y_pred)

    print('----------------------------------------------------------------------')

    from matplotlib import pyplot
    pyplot.plot(fpr, tpr, marker='.', label=text)
    pyplot.xlabel('False Positive Rate')
    pyplot.ylabel('True Positive Rate')
    pyplot.legend()
    pyplot.grid()
    pyplot.show()
```

Results:

XGBoostClassifier

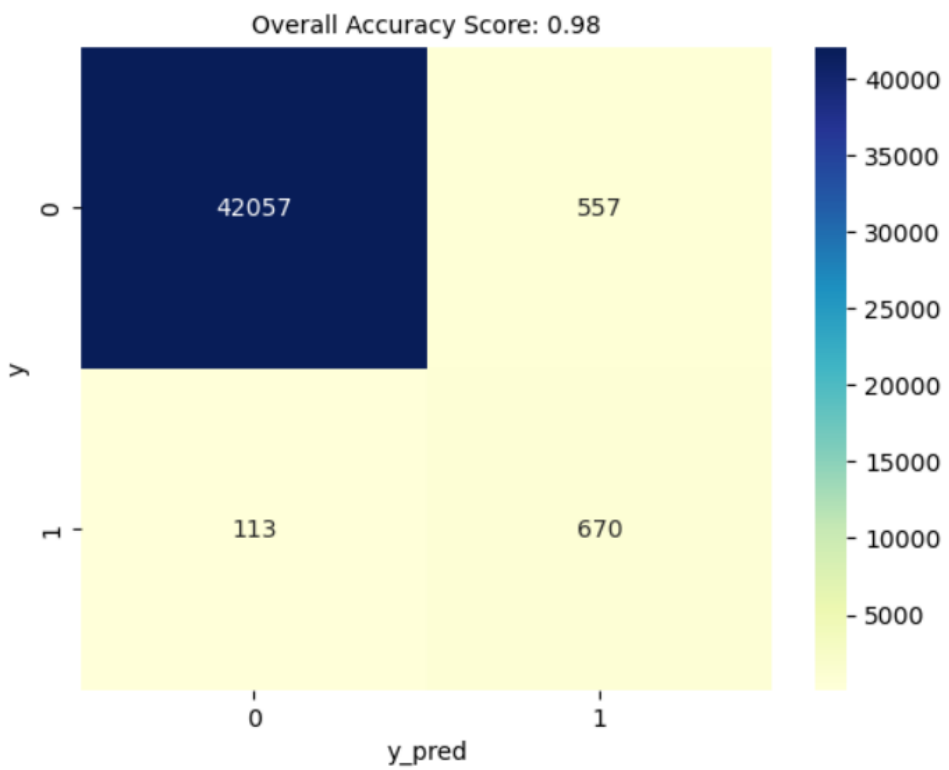
```
              precision    recall  f1-score   support

           0       0.98      0.98      0.98      4896
           1       0.98      0.98      0.98      4949

    accuracy                           0.98      9845
   macro avg       0.98      0.98      0.98      9845
weighted avg       0.98      0.98      0.98      9845

-----------------------------------------------------------------------------
Accuracy: 98.02945657694261%


Area under the ROC Curve is for Validation Set: 0.8982229870196555
Area under the ROC Curve for Testing Set is: 0.9802721212247275
-----------------------------------------------------------------------------
```



RandomForestClassifier

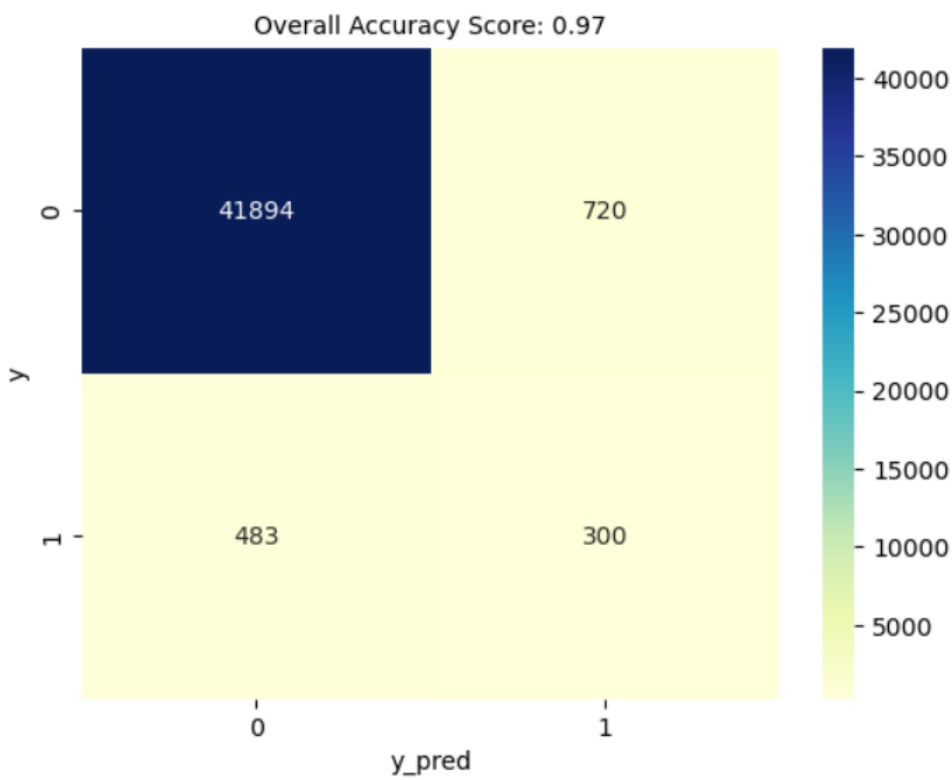
```
              precision    recall  f1-score   support

           0       0.99      0.96      0.98      4896
           1       0.96      0.99      0.98      4949

    accuracy                           0.98      9845
   macro avg       0.98      0.98      0.98      9845
weighted avg       0.98      0.98      0.98      9845

--------------------------------------------------------------------------
Accuracy: 97.55205688166582%


Area under the ROC Curve is for Validation Set: 0.8982229870196555
Area under the ROC Curve for Testing Set is: 0.9754569732183304
--------------------------------------------------------------------------
```



Support Vector Machine

```
              precision    recall  f1-score   support

           0       0.94      0.88      0.91      4896
           1       0.89      0.94      0.92      4949

    accuracy                           0.91      9845
   macro avg       0.91      0.91      0.91      9845
weighted avg       0.91      0.91      0.91      9845

--------------------------------------------------------------------------
Accuracy: 91.2544438801422%



Cross-validation scores with 5 folds:

ROC AUC: 0.971
precision: 0.88
recall: 0.94
f1: 0.91
Area under the ROC Curve for Testing Set is: 0.9123849622357192
--------------------------------------------------------------------------
```