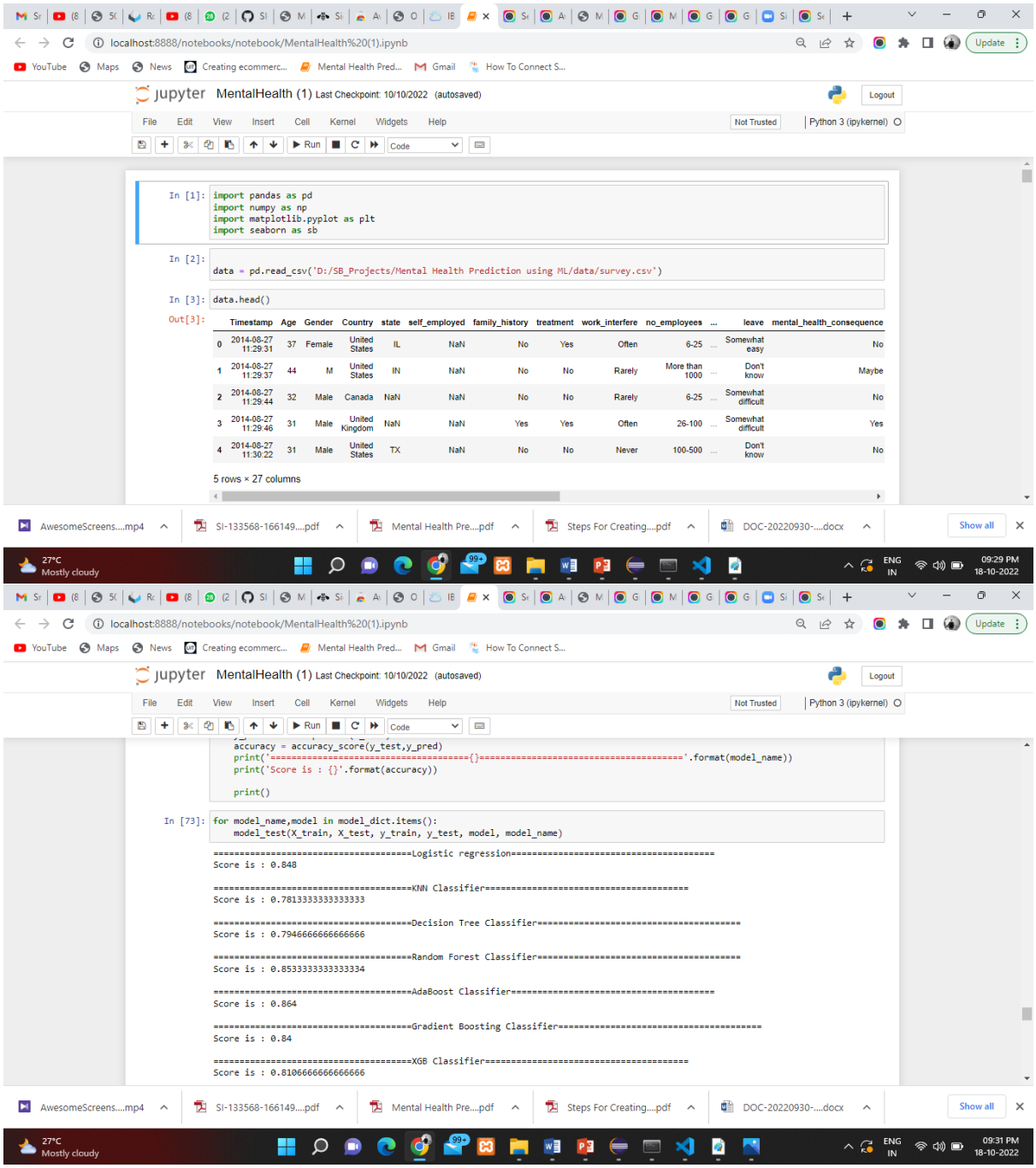
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Python 3 (ipykernel)
Run
Code
In [1]:
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sb
In [2]:
data = pd.read_csv('D:/SB_Projects/Mental Health Prediction using ML/data/survey.csv')
In [3]:
data.head()
Out[3]:
Timestamp Age Gender Country state self_employed family_history treatment work_interfere no_employees ... leave mental_health_consequence
0 2014-08-27 11:29:31 37 Female United States IL NaN No Yes Often 6-25 ... Somewhat easy No
1 2014-08-27 11:29:37 44 M United States IN NaN No No Rarely More than 1000 ... Don't know Maybe
2 2014-08-27 11:29:44 32 Male Canada NaN NaN No No Rarely 6-25 ... Somewhat difficult No
3 2014-08-27 11:29:46 31 Male United Kingdom NaN NaN Yes Yes Often 26-100 ... Somewhat difficult Yes
4 2014-08-27 11:30:22 31 Male United States TX NaN No No Never 100-500 ... Don't know No
5 rows × 27 columns
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Python 3 (ipykernel)
Run
Code
accuracy = accuracy_score(y_test,y_pred)
print('=={}=='.format(model_name))
print('Score is : {}'.format(accuracy))
print()
In [73]:
for model_name,model in model_dict.items():
model_test(X_train, X_test, y_train, y_test, model, model_name)
==========Logistic regression==========
Score is : 0.848
==========KNN Classifier==========
Score is : 0.7813333333333333
==========Decision Tree Classifier==========
Score is : 0.7946666666666666
==========Random Forest Classifier==========
Score is : 0.8533333333333334
==========AdaBoost Classifier==========
Score is : 0.864
==========Gradient Boosting Classifier==========
Score is : 0.84
==========XGB Classifier==========
Score is : 0.8106666666666666
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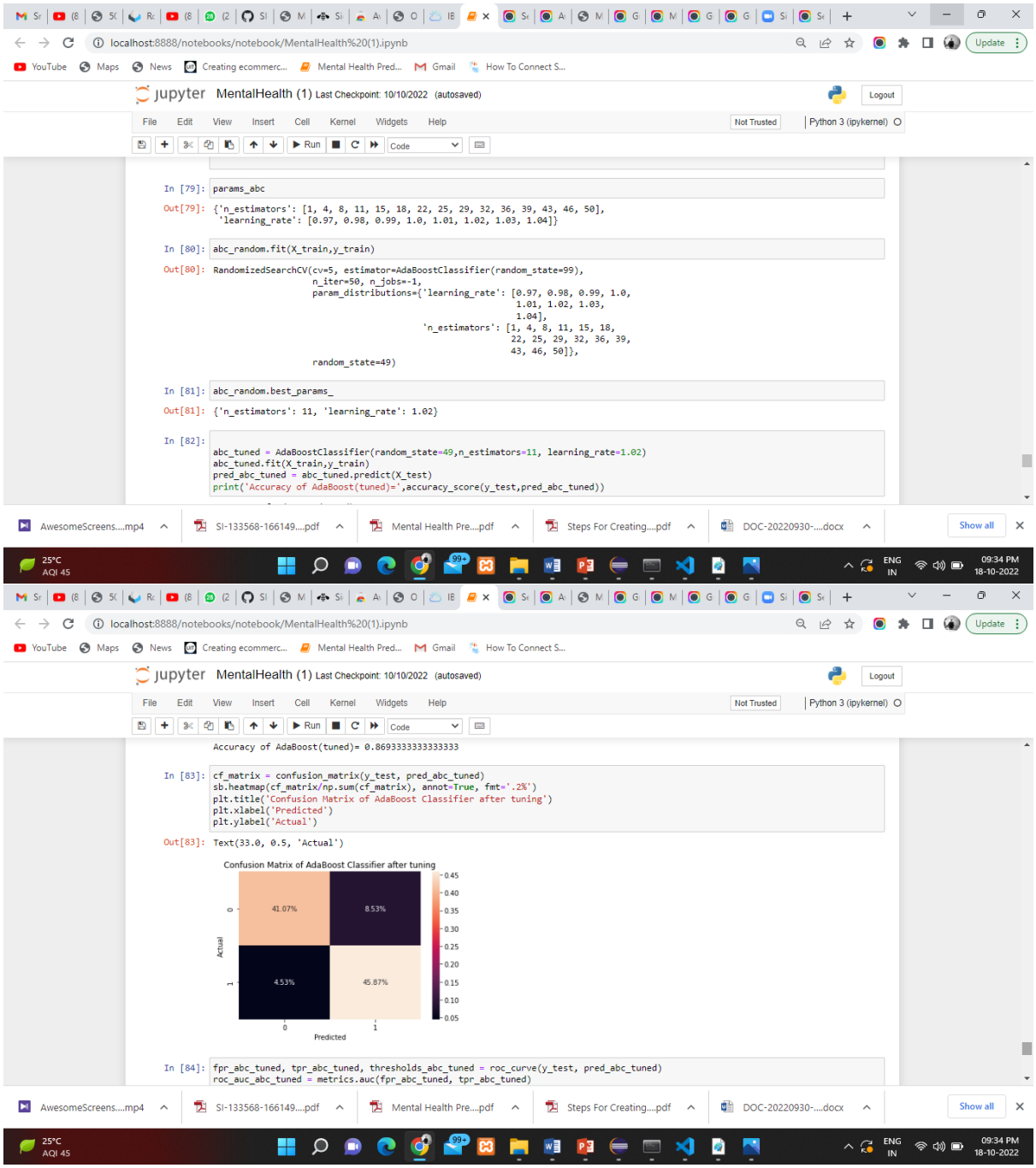
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Python 3 (ipykernel)
In [79]:
params_abc
Out[79]:
{'n_estimators': [1, 4, 8, 11, 15, 18, 22, 25, 29, 32, 36, 39, 43, 46, 50],
'learning_rate': [0.97, 0.98, 0.99, 1.0, 1.01, 1.02, 1.03, 1.04]}
In [80]:
abc_random.fit(X_train,y_train)
Out[80]:
RandomizedSearchCV(cv=5, estimator=AdaBoostClassifier(random_state=99),
n_iter=50, n_jobs=-1,
param_distributions={'learning_rate': [0.97, 0.98, 0.99, 1.0,
1.01, 1.02, 1.03,
1.04],
'n_estimators': [1, 4, 8, 11, 15, 18,
22, 25, 29, 32, 36, 39,
43, 46, 50]},
random_state=49)
In [81]:
abc_random.best_params_
Out[81]:
{'n_estimators': 11, 'learning_rate': 1.02}
In [82]:
abc_tuned = AdaBoostClassifier(random_state=49,n_estimators=11, learning_rate=1.02)
abc_tuned.fit(X_train,y_train)
pred_abc_tuned = abc_tuned.predict(X_test)
print('Accuracy of AdaBoost(tuned)=',accuracy_score(y_test,pred_abc_tuned))
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Accuracy of AdaBoost(tuned)= 0.8693333333333333
In [83]:
cf_matrix = confusion_matrix(y_test, pred_abc_tuned)
sb.heatmap(cf_matrix/np.sum(cf_matrix), annot=True, fmt='.2%')
plt.title('Confusion Matrix of AdaBoost Classifier after tuning')
plt.xlabel('Predicted')
plt.ylabel('Actual')
Out[83]:
Text(33.0, 0.5, 'Actual')
Confusion Matrix of AdaBoost Classifier after tuning
41.07%
8.53%
4.53%
45.87%
Actual
Predicted
In [84]:
fpr_abc_tuned, tpr_abc_tuned, thresholds_abc_tuned = roc_curve(y_test, pred_abc_tuned)
roc_auc_abc_tuned = metrics.auc(fpr_abc_tuned, tpr_abc_tuned)
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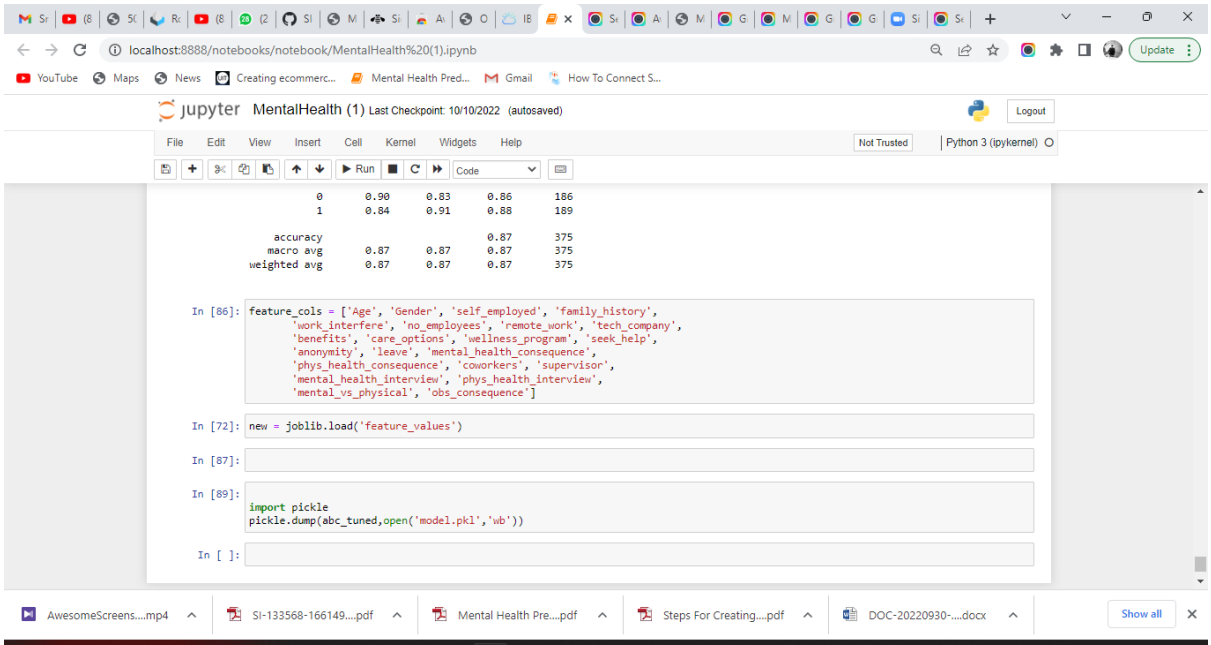


```
                0       0.90      0.83      0.86       186
                1       0.84      0.91      0.88       189

         accuracy                           0.87       375
        macro avg       0.87      0.87      0.87       375
     weighted avg       0.87      0.87      0.87       375
```

In [86]:
```
feature_cols = ['Age', 'Gender', 'self_employed', 'family_history',
       'work_interfere', 'no_employees', 'remote_work', 'tech_company',
       'benefits', 'care_options', 'wellness_program', 'seek_help',
       'anonymity', 'leave', 'mental_health_consequence',
       'phys_health_consequence', 'coworkers', 'supervisor',
       'mental_health_interview', 'phys_health_interview',
       'mental_vs_physical', 'obs_consequence']
```

In [72]:
```
new = joblib.load('feature_values')
```

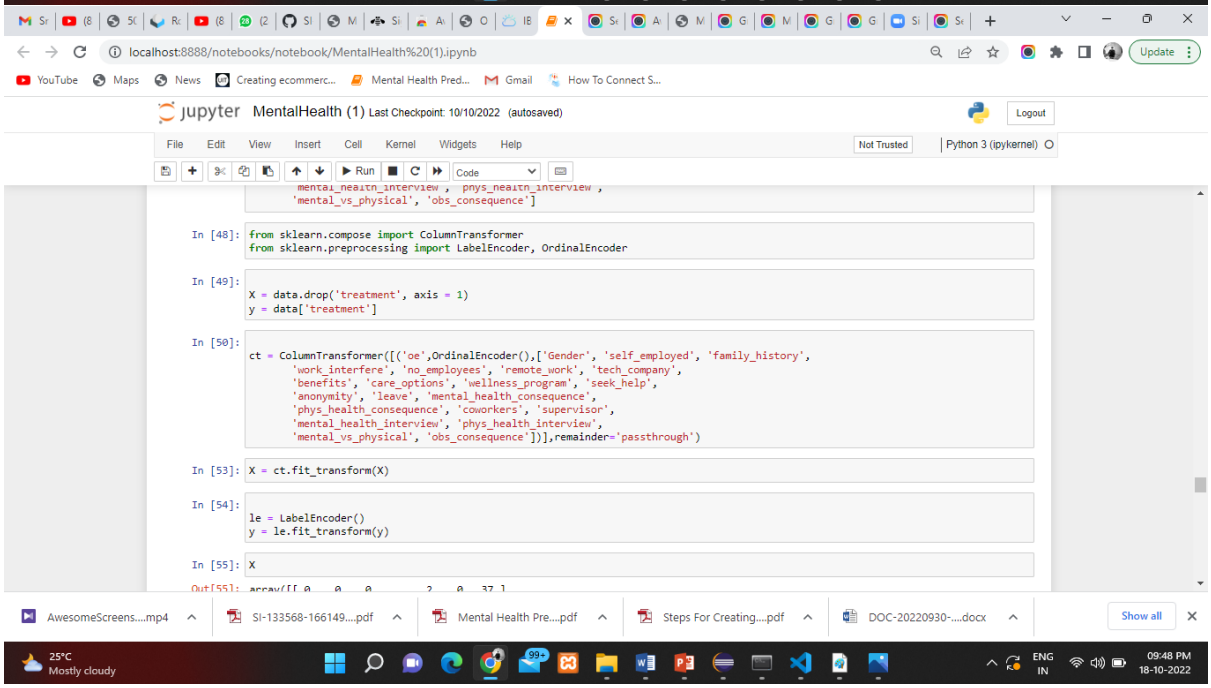
In [87]:
```

```

In [89]:
```
import pickle
pickle.dump(abc_tuned,open('model.pkl','wb'))
```

In [ ]:
```

```

```
       'mental_vs_physical', 'obs_consequence']
```

In [48]:
```
from sklearn.compose import ColumnTransformer
from sklearn.preprocessing import LabelEncoder, OrdinalEncoder
```

In [49]:
```
X = data.drop('treatment', axis = 1)
y = data['treatment']
```

In [50]:
```
ct = ColumnTransformer([('oe',OrdinalEncoder(),['Gender', 'self_employed', 'family_history',
       'work_interfere', 'no_employees', 'remote_work', 'tech_company',
       'benefits', 'care_options', 'wellness_program', 'seek_help',
       'anonymity', 'leave', 'mental_health_consequence',
       'phys_health_consequence', 'coworkers', 'supervisor',
       'mental_health_interview', 'phys_health_interview',
       'mental_vs_physical', 'obs_consequence'])],remainder='passthrough')
```

In [53]:
```
X = ct.fit_transform(X)
```

In [54]:
```
le = LabelEncoder()
y = le.fit_transform(y)
```

In [55]:
```
X
```

Out[55]:
```
array([[ 0.,  0.,  0.,  2.,  0., 37.],
```

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```
In [60]: X_train.shape, X_test.shape, y_train.shape, y_test.shape
Out[60]: ((872, 22), (375, 22), (872,), (375,))

In [70]: from sklearn.linear_model import LogisticRegression
         from sklearn.tree import DecisionTreeClassifier
         from sklearn.neighbors import KNeighborsClassifier
         from sklearn.ensemble import RandomForestClassifier, AdaBoostClassifier, GradientBoostingClassifier
         from xgboost.sklearn import XGBClassifier
         from sklearn import metrics
         from sklearn.metrics import accuracy_score, roc_curve, confusion_matrix, classification_report, auc

In [71]: model_dict = {}

         model_dict['Logistic regression']= LogisticRegression(solver='liblinear',random_state=49)
         model_dict['KNN Classifier'] = KNeighborsClassifier()
         model_dict['Decision Tree Classifier'] = DecisionTreeClassifier(random_state=49)
         model_dict['Random Forest Classifier'] = RandomForestClassifier(random_state=49)
         model_dict['AdaBoost Classifier'] = AdaBoostClassifier(random_state=49)
         model_dict['Gradient Boosting Classifier'] = GradientBoostingClassifier(random_state=49)
         model_dict['XGB Classifier'] = XGBClassifier(random_state=49)

In [72]: def model_test(X_train, X_test, y_train, y_test,model,model_name):
             model.fit(X_train,y_train)
             y_pred = model.predict(X_test)
```

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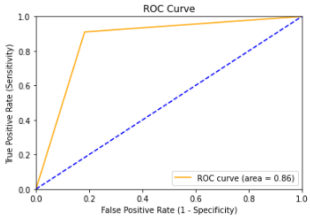
Not Trusted | Python 3 (ipykernel)

```
         plt.ylabel('True Positive Rate (Sensitivity)')
         plt.legend(loc="lower right")
         plt.show()
         roc_curve(y_test, pred_abc)
```




```
Out[76]: (array([0.       , 0.1827957, 1.       ]),
          array([0.        , 0.91005291, 1.        ]),
          array([2, 1, 0], dtype=int64))

In [77]: print(classification_report(y_test,pred_abc))
                      precision    recall  f1-score   support
```

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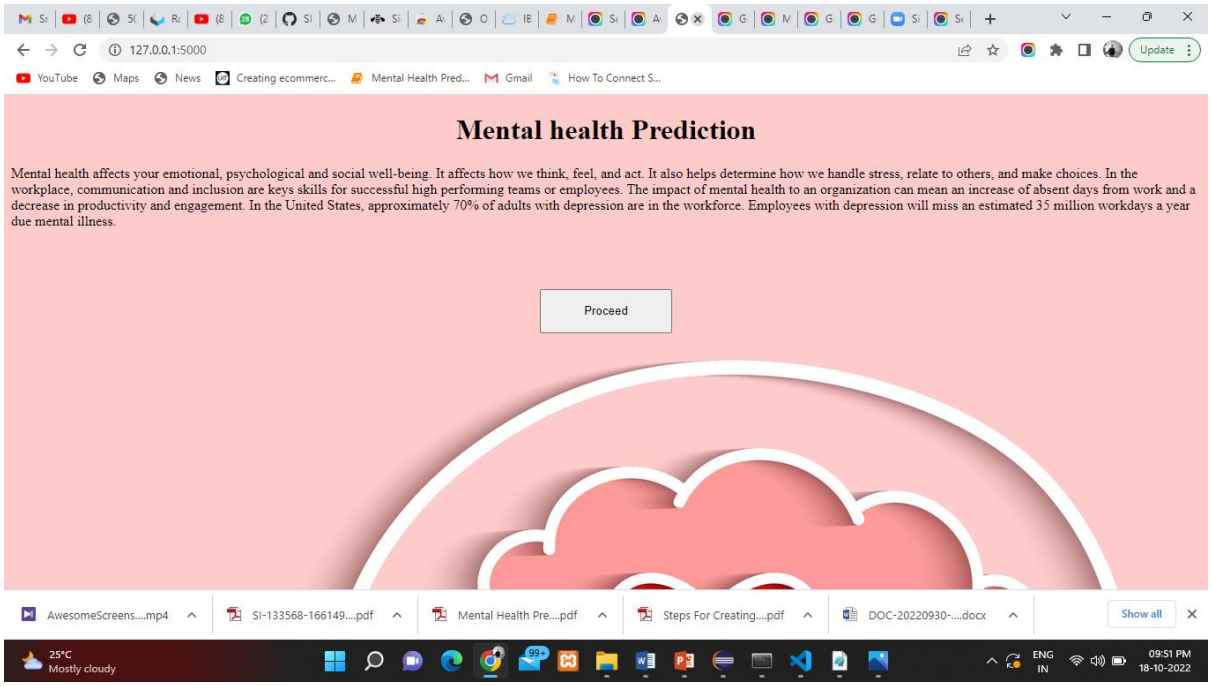
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Update
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Maps
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Creating ecommerc...
Mental Health Pred...
Gmail
How To Connect S...
Mental health Prediction
Mental health affects your emotional, psychological and social well-being. It affects how we think, feel, and act. It also helps determine how we handle stress, relate to others, and make choices. In the workplace, communication and inclusion are keys skills for successful high performing teams or employees. The impact of mental health to an organization can mean an increase of absent days from work and a decrease in productivity and engagement. In the United States, approximately 70% of adults with depression are in the workforce. Employees with depression will miss an estimated 35 million workdays a year due mental illness.
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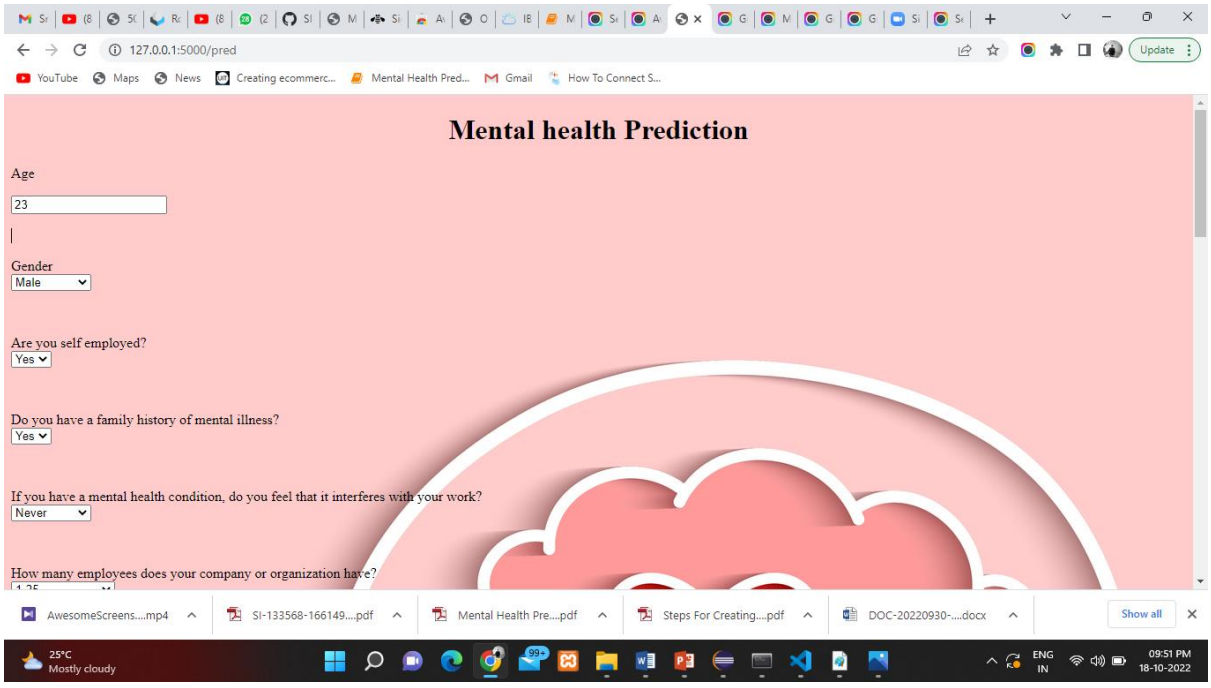
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YouTube
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How To Connect S...
Mental health Prediction
Age
23
Gender
Male
Are you self employed?
Yes
Do you have a family history of mental illness?
Yes
If you have a mental health condition, do you feel that it interferes with your work?
Never
How many employees does your company or organization have?
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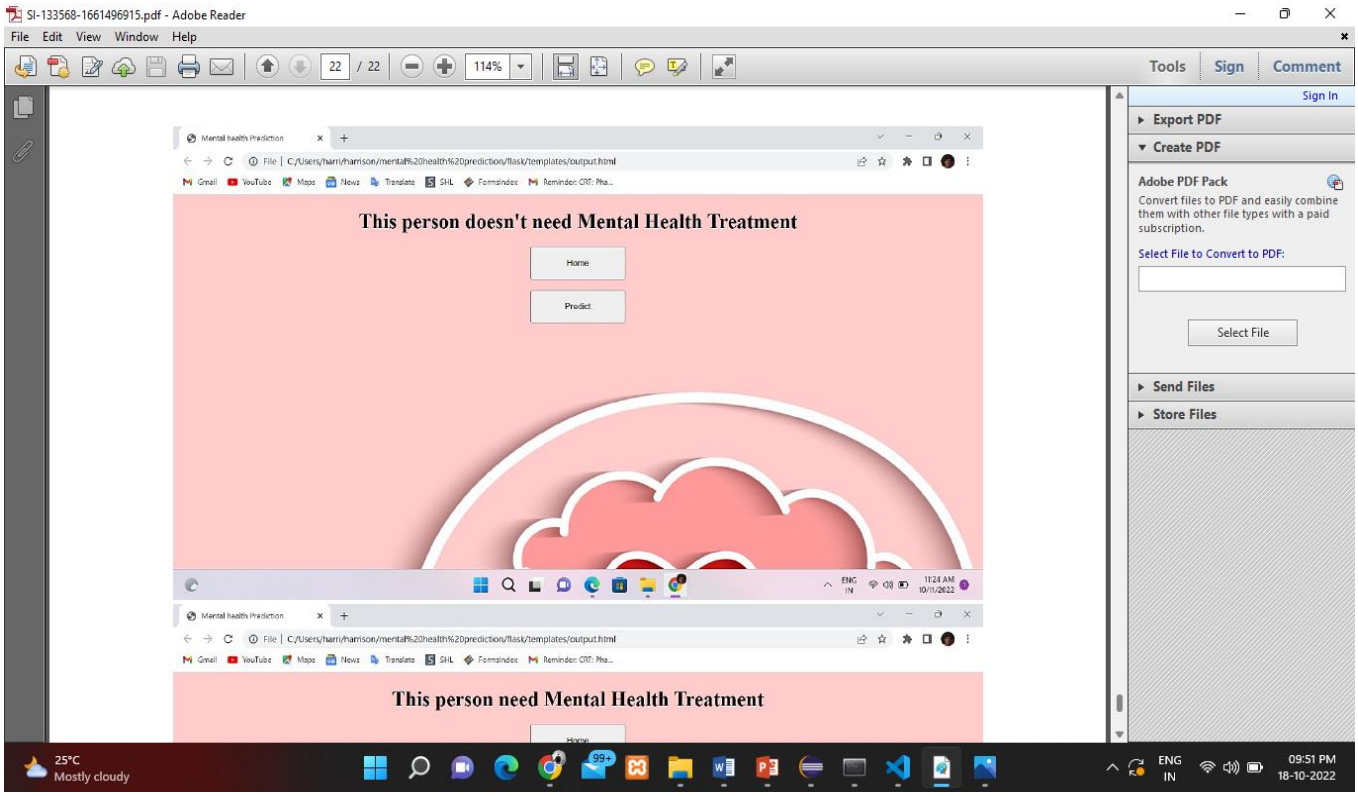
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This person doesn't need Mental Health Treatment
Home
Predict
This person need Mental Health Treatment
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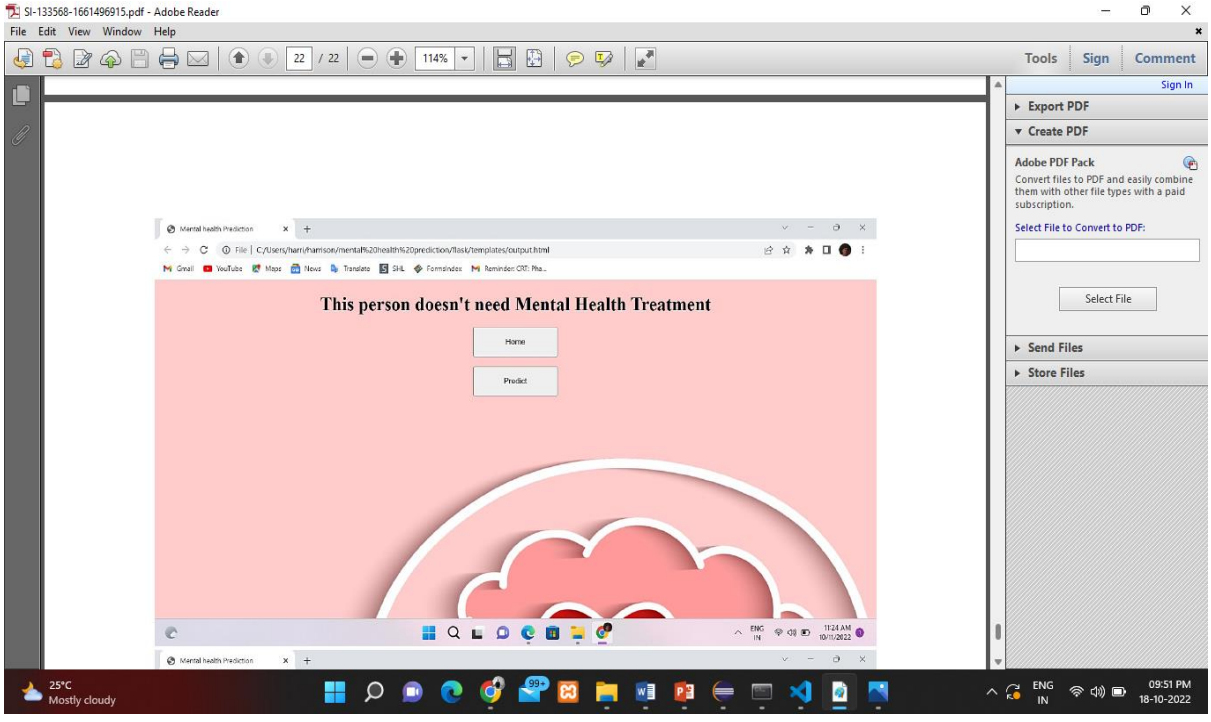
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Home
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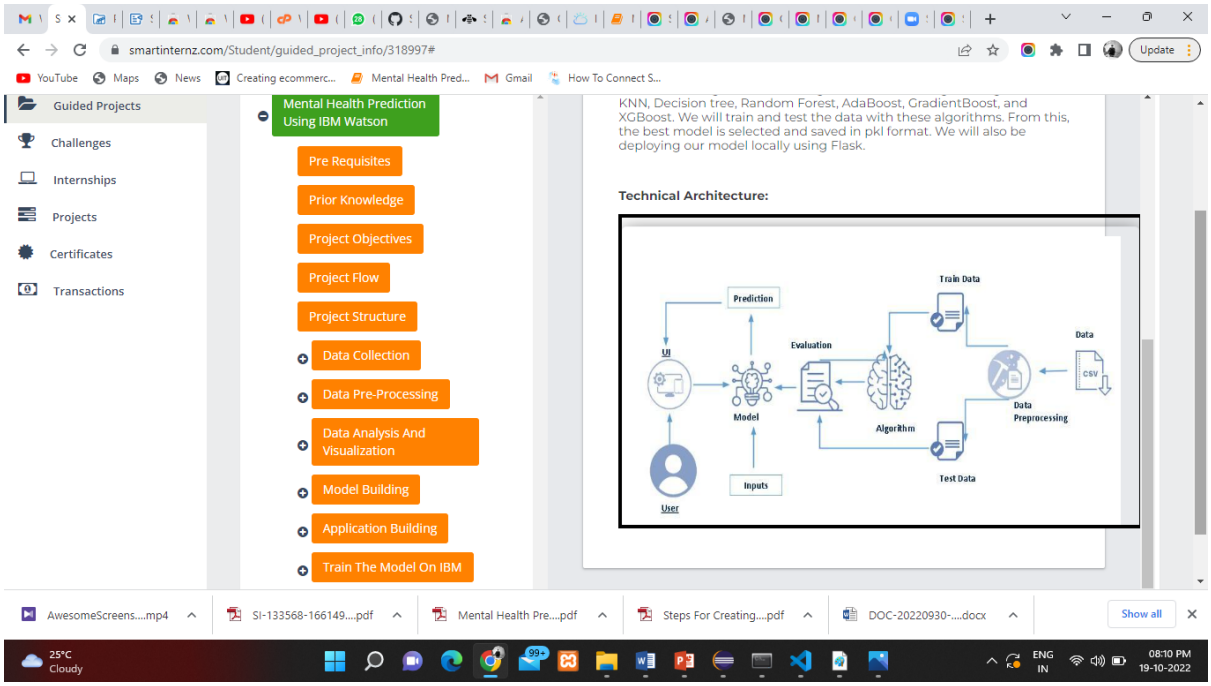
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Guided Projects
Challenges
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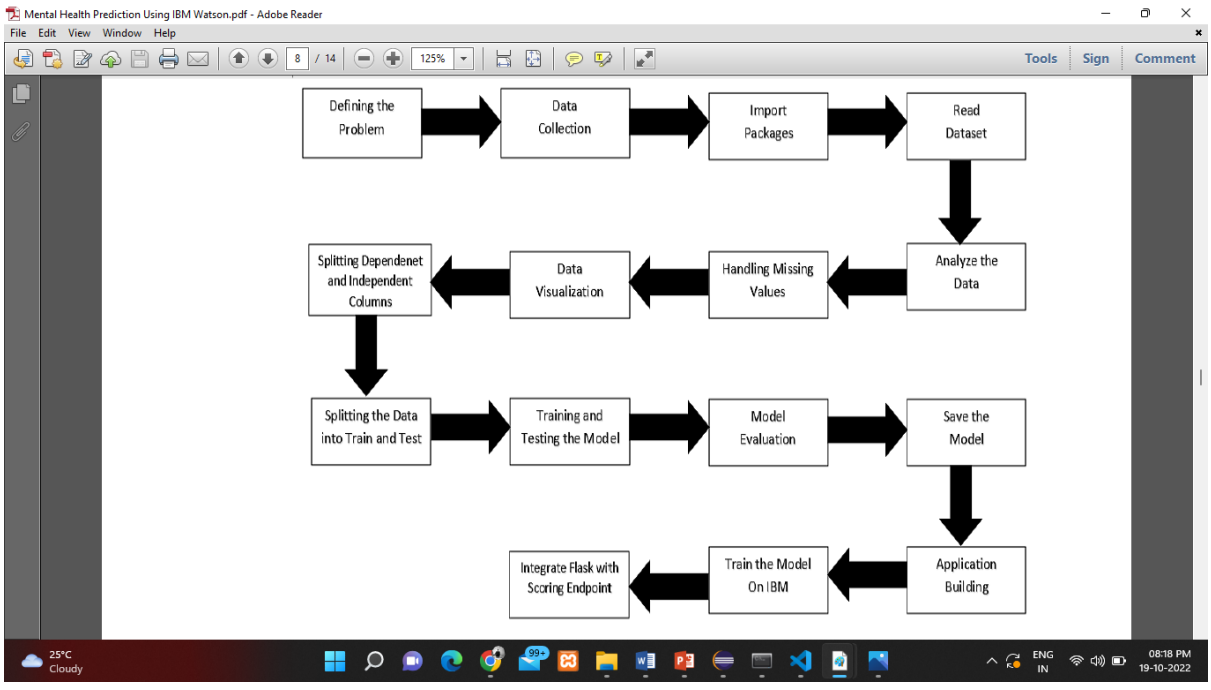
Projects
Certificates
Transactions
Mental Health Prediction Using IBM Watson
Pre Requisites
Prior Knowledge
Project Objectives
Project Flow
Project Structure
Data Collection
Data Pre-Processing
Data Analysis And Visualization
Model Building
Application Building
Train The Model On IBM
KNN, Decision tree, Random Forest, AdaBoost, GradientBoost, and XGBoost. We will train and test the data with these algorithms. From this, the best model is selected and saved in pkl format. We will also be deploying our model locally using Flask.
Technical Architecture:
Train Data
Prediction
Data
UI
Evaluation
CSV
Model
Algorithm
Data Preprocessing
Test Data
Inputs
User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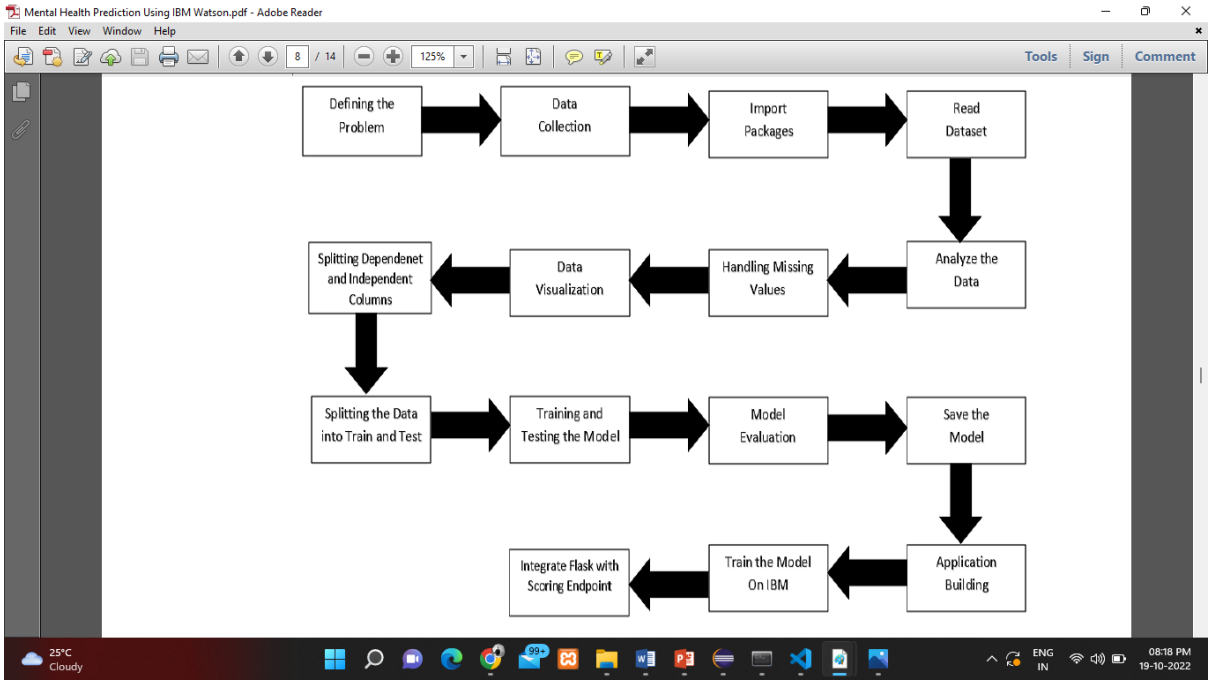
Defining the Problem
Data Collection
Import Packages
Read Dataset
Analyze the Data
Handling Missing Values
Data Visualization
Splitting Dependenet and Independent Columns
Splitting the Data into Train and Test
Training and Testing the Model
Model Evaluation
Save the Model
Application Building
Train the Model On IBM
Integrate Flask with Scoring Endpoint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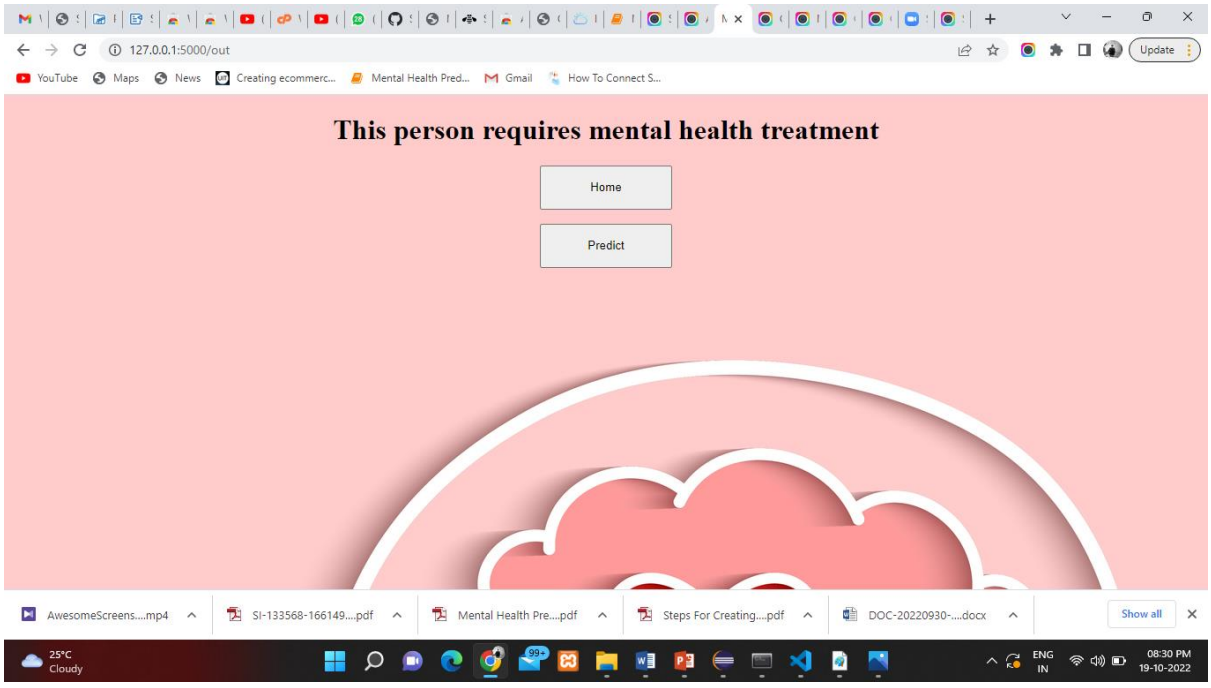
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