

PLACEMENT ANALYSIS

Problem Statement:

The employability of graduates is a crucial metric for academic institutions and students. With the increasing number of graduates each year, determining the factors that influence placement status has become vital. This project aims to predict whether a student will be placed or not based on their academic and personal details.

Aim:

To develop a machine learning model that predicts the placement status of students using their academic and personal information. The goal is to identify students who are likely to secure job placements and understand the key factors that influence employability.

Solution:

The solution involves creating a machine learning model using Support Vector Machine (SVM) that can classify students into 'Placed' or 'Not Placed' categories based on their input features such as gender, academic scores, board of study, specialization, work experience, and others. The model will be trained on historical data of students and their placement outcomes.

Machine Learning Model:

Support Vector Machine (SVM):

SVM is a powerful classification algorithm that works by finding the hyperplane that best separates the classes in the feature space. The algorithm maximizes the margin between the data points of different classes, ensuring robust classification even with high-dimensional data.

Model Training

The model was trained using a dataset of student attributes. Key steps included data normalization, splitting the data into training and testing sets, and tuning the SVM hyperparameters for optimal performance.

Model Evaluation

The model's performance was evaluated using metrics such as accuracy, precision, recall, and the confusion matrix. Cross-validation was employed to ensure the model's generalizability.

Concepts Used:

1. Machine Learning: Utilizing SVM for classification to predict binary outcomes.
2. Data Preprocessing: Handling missing values, encoding categorical variables, and scaling numerical features.
3. Model Training: Training an SVM model on the pre-processed dataset.

4. Evaluation: Assessing the model's performance using appropriate metrics like accuracy, precision, recall, and F1-score.

Technology Stack:

1. Python: For implementing the machine learning model and preprocessing the data.
2. Pandas: For data manipulation and preprocessing.
3. Scikit-learn: For implementing the SVM model and preprocessing utilities like StandardScaler.
4. Flask: Front-end

Code:

App.py

```
import pandas as pd from sklearn.preprocessing
import StandardScaler from sklearn.svm import
SVC
# Load the dataset
df = pd.read_csv('placement.csv')
# Preprocess the dataset
X_classification = df.drop(['sl_no', 'salary', 'status'], axis=1)
X_classification = pd.get_dummies(X_classification) # One-hot encode categorical variables
y_classification = df['status']
# Normalize the features
scaler = StandardScaler()
X_classification_scaled = scaler.fit_transform(X_classification)
# Train the SVM classification model svm_clf =
SVC(kernel='linear')
svm_clf.fit(X_classification_scaled,
y_classification)
def preprocess_user_data(user_data):
    user_df = pd.DataFrame(user_data, index=[0])    user_df_encoded =
pd.get_dummies(user_df)    user_df_encoded =
user_df_encoded.reindex(columns=X_classification.columns, fill_value=0)    return
user_df_encoded
```

Example usage:

```
user_data = {  
    'gender': 'M',  
    'ssc_p': 85.0,  
    'ssc_b': 'Central',  
    'hsc_p': 88.0,  
    'hsc_b': 'Central',  
    'hsc_s': 'Science',  
    'degree_p': 75.0,  
    'degree_t': 'Sci&Tech',  
    'workex': 'Yes',  
    'etest_p': 78.0,  
    'specialisation': 'Mkt&Fin',  
    'mba_p': 80.0  
}
```

Preprocess user data user_df_encoded =

preprocess_user_data(user_data)

Make sure the columns in user_df_encoded match X_classification

missing_cols = set(X_classification.columns) -

set(user_df_encoded.columns) for col in missing_cols:

user_df_encoded[col] = 0

Reorder columns to match

X_classification user_df_encoded =

user_df_encoded[X_classification.columns]

Scale the user data user_df_encoded_scaled =

scaler.transform(user_df_encoded)

Predict placement status

placement_status =

svm_clf.predict(user_df_encoded_scaled)

```
result = "Placed" if placement_status[0] == 1 else "Not  
Placed" print(result)  
...
```

result.html

```
<!DOCTYPE html>  
<html lang="en">  
<head>  
    <meta charset="UTF-8">  
    <meta http-equiv="X-UA-Compatible" content="IE=edge">  
    <meta name="viewport" content="width=device-width, initial-scale=1.0">  
    <title>Placement Status Prediction Result</title>  
</head>  
<body>  
    <h1>Placement Status Prediction Result</h1>  
    <p>Predicted Placement Status: {{ result }}</p>  
    <a href="/">Go back</a>  
</body>  
</html>
```

Index.html :

```
<!DOCTYPE html>  
<html lang="en">  
<head>  
    <meta charset="UTF-8">  
    <meta http-equiv="X-UA-Compatible" content="IE=edge">  
    <meta name="viewport" content="width=device-width, initial-scale=1.0">  
    <title>Placement Status Prediction</title>  
</head>  
<body>  
    <h1>Placement Status Prediction</h1>  
    <form action="/predict" method="post">  
        <label for="gender">Gender (M/F):</label>
```

```

<input type="text" id="gender" name="gender"><br><br>
<label for="ssc_p">SSC Percentage:</label>
<input type="text" id="ssc_p" name="ssc_p"><br><br>
<label for="ssc_b">SSC Board (Central/Others):</label>
<input type="text" id="ssc_b" name="ssc_b"><br><br>
<label for="hsc_p">HSC Percentage:</label>
<input type="text" id="hsc_p" name="hsc_p"><br><br>
<label for="hsc_b">HSC Board (Central/Others):</label>
<input type="text" id="hsc_b" name="hsc_b"><br><br>
<label for="hsc_s">HSC Specialization (Commerce/Science/Arts):</label>
<input type="text" id="hsc_s" name="hsc_s"><br><br>
<label for="degree_p">Degree Percentage:</label>
<input type="text" id="degree_p" name="degree_p"><br><br>
<label for="degree_t">Degree Type (Sci&Tech/Comm&Mgmt/Others):</label>
<input type="text" id="degree_t" name="degree_t"><br><br>
<label for="workex">Work Experience (Yes/No):</label>
<input type="text" id="workex" name="workex"><br><br>
<label for="etest_p">E-Test Percentage:</label>
<input type="text" id="etest_p" name="etest_p"><br><br>
<label for="specialisation">MBA Specialization (Mkt&Fin/Mkt&HR):</label>
<input type="text" id="specialisation" name="specialisation"><br><br>
<label for="mba_p">MBA Percentage:</label>
<input type="text" id="mba_p" name="mba_p"><br><br>
<input type="submit" value="Predict Placement Status">
</form>
</body>
</html>

```

CLOUD DEPLOYMENT:

This project has been deployed on Microsoft Azure for easy accessibility and scalability. The deployed application can be accessed using the following link:

OUTPUT:

Placement Status Prediction

Gender (M/F):

SSC Percentage:

SSC Board (Central/Others):

HSC Percentage:

HSC Board (Central/Others):

HSC Specialization (Commerce/Science/Arts):

Degree Percentage:

Degree Type (Sci&Tech/Comm&Mgmt/Others):

Work Experience (Yes/No):

E-Test Percentage:

MBA Specialization (Mkt&Fin/Mkt&HR):

MBA Percentage:

Placement Status Prediction Result

Predicted Placement Status: Placed

[Go back](#)