



Placement Prediction App using Flask

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Machine learning is a widely employed method for making predictions. Numerous algorithms are accessible in different libraries for predictive tasks. In this article, we'll construct a placement prediction model using [Random Forest Classifier](#) with historical data and later we will store that model to .pkl file to integrate it with our **Flask app** using [Python](#).

Placement Prediction in ML using Flask

The motive behind this project is to predict the chance or probability of students getting placed in campus placement drives. Our motive would be to create a full working application that would make predictions. For all this, we require a basic knowledge of [Flask](#), [HTML](#), and [Machine Learning](#). We've taken historical campus placement data and constructed a robust model that can forecast your chances of getting placed.

Topics Covered

- Virtual Environment Setup
- ML model for predictions
- Integration with Flask
- Deployment on the local host

Steps for Creating a Placement Prediction App

Step 1: Create a virtual environment

[Flask Templates](#) [Jinja2](#) [Flask-REST API](#) [Python SQLAlchemy](#) [Flask Bcrypt](#) [Flask Cookies](#) [Json](#) [Postman](#)

Pycharm. To create a [virtual Environment](#) write the following code in the terminal.

- `python -m venv <environment name>`
- `<environment name>\Scripts\activate`

```
\PycharmProjects\plac> python -m venv myenv
\PycharmProjects\plac> myenv\Scripts\activate
```

ing1: to create an environment

Step 2: Create a Predictive model

placement.py

In this code, a dataset ('Placement_Data_Full_Class.csv') is loaded using pandas, and Label Encoding is applied to convert categorical variables (gender, ssc_b, hsc_b, hsc_s, degree_t, workex, specialisation, status) into numerical format. Missing values in the 'salary' column are filled with the median. The dataset is split into features (X) and target variable (y). A RandomForestClassifier with 26 estimators is trained on the training set, and the resulting model is saved as 'placement.pkl' using the pickle module.

Dataset: [Dataset link](#)

Python3



```
1 import pandas as pd
2 import numpy as np
3 import pickle
4
5 df=pd.read_csv('Placement_Data_Full_Class.csv')
6
7 from sklearn.preprocessing import LabelEncoder
8 encoder = LabelEncoder()
9 df['gender']=encoder.fit_transform(df['gender'])
10 df['ssc_b']=encoder.fit_transform(df['ssc_b'])
11 df['hsc_b']=encoder.fit_transform(df['hsc_b'])
12 df['hsc_s']=encoder.fit_transform(df['hsc_s'])
13 df['degree_t']=encoder.fit_transform(df['degree_t'])
14 df['workex']=encoder.fit_transform(df['workex'])
15 df['specialisation']=encoder.fit_transform(df['specialisation'])
16 df['status']=encoder.fit_transform(df['status'])
```

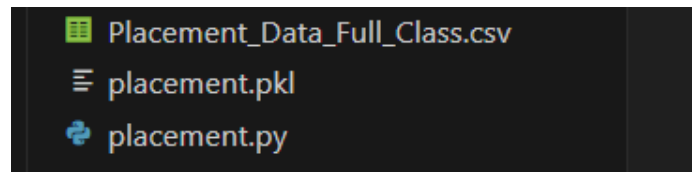
```

18 df['salary'] = df['salary'].fillna(df['salary'].median())
19
20 X=df.drop('status',axis=1)
21 y=df['status']
22
23 from sklearn.model_selection import train_test_split
24 X_train,X_test,y_train,y_test =
    train_test_split(X,y,test_size=0.3,random_state=101)
25
26 from sklearn.ensemble import RandomForestClassifier
27 rf=RandomForestClassifier(n_estimators=26)
28 rf.fit(X_train,y_train)
29
30 pickle.dump(rf,open('placement.pkl','wb'))

```

Now, paste the above code into your .py file and run it using python <Name of File>.py in the terminal. After running the code, a .pkl file would be generated.

Output



img2: .pkl file generated

Step 3: Setting up GUI

front.html: This code creates a Flask web application that lets users input data. When users submit the form, the data is used to make predictions with a pre-trained machine learning model. The results are then displayed on a webpage. The 'placement.pkl' model is loaded using the 'pickle' library.

HTML

```

1 <!DOCTYPE html>
2 <html>
3 <head>
4     <title>Placement Prediction</title>
5     <style type="text/css">
6         h1{ font-size: 60px;
7             text-align: center;
8             color: #e32037;
9             border: 5px solid black;
10            font-family: 'Impact';
11            }
12
13        body{
14            background-size:cover;
15        }
16
17        legend{font-size: 20px;

```

```

text-align: center;}}
19
20
21     .note{color: #FF0000;}
22
23
24     </style>
25
26     <link rel="stylesheet" href="https://cdn.jsdelivr.net/npm/bootstrap@4.6
27     <script src="https://code.jquery.com/jquery-3.2.1.slim.min.js" integrity
28     <script src="https://cdn.jsdelivr.net/npm/popper.js@1.12.9/dist/umd/pop
29     <script src="https://cdn.jsdelivr.net/npm/bootstrap@4.0.0/dist/js/boot
30 </head>
31 <body>
32
33     <div class="jumbotron">
34         <h1 class="display-4">PLACEMENT PREDICTION</h1>
35         <p class="lead">Just fill the given details and check your chanc
36         <hr class="my-4">
37         <p>Fill the details.</p>
38         <p class="lead">
39             <form method="POST", action="{{url_for('home')}}">
40                 <fieldset>
41                     <br>
42
43                     <div class="input-group mb-3">
44                         <div class="input-group-prepend">
45                             <span class="input-group-text" id="inputGroup-sizi
46                         </div>
47                         <input type ="number" name="id" class="form-control"
48                     </div>
49
50                     <div class="input-group mb-3">
51                         <div class="input-group-prepend">
52                             <span class="input-group-text" id="inputGroup-sizi
53                         </div>
54                         <input type ="number" name="gender" min="0" max="1
55                     </div>
56
57                     <div class="input-group mb-3">
58                         <div class="input-group-prepend">
59                             <span class="input-group-text" id="inputGroup-sizi
60                         </div>
61                         <input type ="number" name="marks1" min="0" max="10
62                     </div>
63
64                     <div class="input-group mb-3">
65                         <div class="input-group-prepend">
66                             <span class="input-group-text" id="inputGroup-sizi
67                         </div>
68                         <input type ="number" name="boards1" min="0" max="1'
69                     </div>
70
71                     <div class="input-group mb-3">
72                         <div class="input-group-prepend">
73                             <span class="input-group-text" id="inputGroup-sizi
74                     </div>

```

```

76         <input type ="number"  name="marks2" min="0" max="100"
77     </div>
78     <div class="input-group mb-3">
79         <div class="input-group-prepend">
80             <span class="input-group-text" id="inputGroup-sizi
81         </div>
82         <input type ="number"  name="boards2" min="0" max="1'
83     </div>
84
85     <div class="input-group mb-3">
86         <div class="input-group-prepend">
87             <span class="input-group-text" id="inputGroup-sizi
88         </div>
89         <input type ="number"  name="strm" min="0" max="2" c
90     </div>
91
92     <div class="input-group mb-3">
93         <div class="input-group-prepend">
94             <span class="input-group-text" id="inputGroup-sizi
95         </div>
96         <input type ="number"  name="deg_p" min="0" max="100
97     </div>
98
99     <div class="input-group mb-3">
100         <div class="input-group-prepend">
101             <span class="input-group-text" id="inputGroup-sizi
102         </div>
103         <input type ="number"  name="deg_s" min="0" max="2"
104     </div>
105
106     <div class="input-group mb-3">
107         <div class="input-group-prepend">
108             <span class="input-group-text" id="inputGroup-sizi
109         </div>
110         <input type ="number"  name="wr_x" min="0" max="1" cl
111     </div>
112
113     <div class="input-group mb-3">
114         <div class="input-group-prepend">
115             <span class="input-group-text" id="inputGroup-sizi
116         </div>
117         <input type ="number"  name="amcat" min="0" max="100
118     </div>
119
120     <div class="input-group mb-3">
121         <div class="input-group-prepend">
122             <span class="input-group-text" id="inputGroup-sizi
123         </div>
124         <input type ="number"  name="sp" min="0" max="1" clas
125     </div>
126
127     <div class="input-group mb-3">
128         <div class="input-group-prepend">
129             <span class="input-group-text" id="inputGroup-sizi
130         </div>
131         <input type ="number"  name="mba_p" min="0" max="100'

```

```

133
134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
149
150
151
152
153
154
155
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157
158
159
160
161
162

```

```

</div>

<div class="input-group mb-3">
  <div class="input-group-prepend">
    <span class="input-group-text" id="inputGroup-sizi
  </div>
  <input type ="number" name="sal" class="form-control"
</div>

<input type="submit" value ="predict!" class="btn btn-pr
<a href="{{ url_for('home')}}"></a>
</fieldset>
</form>

<fieldset><legend>Note</legend>

  1. For Gender: press 0 for female and 1 for male<br>
  2. For Class 10th and 12th Boards: 0 for central and 1
  3. For Class 12th Subject/Stream: 0 for Commerce 1 for
  4. For degree stream: 0 for Commerce, 1 for other and
  5. For work Experience: 0 for No and 1 for Yes<br>
  6. MBA Specialisation: 0 for (Finance and Marketing) a

</fieldset>

</p>
</div>

</body>
</html>

```

Output

PLACEMENT PREDICTION

Just fill the given details and check your chances of getting placed.

Fill the details.

id

Gender

Class 10th Marks

Class 10th Boards

Class 12th Marks

Class 12th Boards

Class 12th Subject/Stream

Degree Percentage

Degree Subject/Stream

Work Experience

AMCAT/Employblity Test Score

Specialisation

MBA Percentage

Salary

predict!

home.html: The page displays a result message, which can be either "Congratulations!!!" in green if the prediction is positive or "Sorry!" in red if the prediction is negative. This code also converts the numeric values(input values) into human readable text(e.g., '0' for gender becomes 'Female').

HTML



```

1  <html>
2  <head>
3    <link rel="stylesheet" href="https://cdn.jsdelivr.net/npm/bootstrap@4.
4    <script src="https://code.jquery.com/jquery-3.2.1.slim.min.js" integrit
5    <script src="https://cdn.jsdelivr.net/npm/popper.js@1.12.9/dist/umd/pop
6    <script src="https://cdn.jsdelivr.net/npm/bootstrap@4.0.0/dist/js/boot
7  </head>
8  <body bgcolor=#1ff0d0>
9
10     <center>
11
12         <div class="jumbotron">
```

```

14     <h1 class="display-4">RESULT</h1>
15     <hr class="my-4">
16     {%if data == 0%}
17     <h1 style = "Color : red">Sorry!</h1>
18     <h3>You have less chances of getting placed</h3>
19
20
21     {%else%}
22     <h1 style ="Color : GREEN">Congratulations!!!</h1>
23     <h3>You have high chances of getting placed</h3>
24
25
26     {%endif%}
27
28     <br><br>
29     <a href='/'>Go back to home page</a>
30     <br><br>
31
32     <p class="lead">
33
34     </p>
35     </div>
36
37 </center>
38
39
40 <table class="table">
41     <thead class="thead-dark">
42         <tr>
43             <th scope="col">Index</th>
44             <th scope="col">Information</th>
45             <th scope="col">Value</th>
46         </tr>
47     </thead>
48     <tbody>
49         <tr>
50             <th scope="row">1</th>
51             <td>ID</td>
52             <td>{{ data1 }}</td>
53         </tr>
54         <tr>
55             <th scope="row">2</th>
56             <td>Gender</td>
57             <td>
58                 {% if data2 == '0' %}
59                 {% set data2_new = 'Female' %}
60                 {% elif data2 == '1' %}
61                 {% set data2_new = 'Male' %}
62                 {% else %}
63                 {% set data2_new = 'Not a valid response' %}
64                 {% endif %}
65
66                 {{ data2_new }}
67             </td>
68         </tr>
69

```



```

71     <th scope="row">3</th>
72     <td>Class 10th Marks</td>
73     <td>{{data3}}</td>
74
75 </tr>
76
77 <tr>
78     <th scope="row">4</th>
79     <td>Class 10th Boards</td>
80     <td>
81         {% if data4 == '0' %}
82         {% set data4_new = 'Central' %}
83         {% elif data4 == '1' %}
84         {% set data4_new = 'Other' %}
85         {% else %}
86         {% set data4_new = 'Not a valid response' %}
87         {% endif %}
88
89         {{ data4_new }}
90
91     </td>
92
93 </tr>
94 <tr>
95     <th scope="row">5</th>
96     <td>Class 12th Marks</td>
97     <td>{{data5}}</td>
98
99 </tr>
100 <tr>
101     <th scope="row">6</th>
102     <td>Class 12th Boards</td>
103     <td>
104         {% if data6 == '0' %}
105         {% set data6_new = 'Central' %}
106         {% elif data6 == '1' %}
107         {% set data6_new = 'Other' %}
108         {% else %}
109         {% set data6_new = 'Not a valid response' %}
110         {% endif %}
111
112         {{ data6_new }}
113
114     </td>
115
116 </tr>
117
118 <tr>
119     <th scope="row">7</th>
120     <td>Class 12th Subject/Stream</td>
121     <td>
122         {% if data7 == '0' %}
123         {% set data7_new = 'Commerce' %}
124         {% elif data7 == '1' %}
125         {% set data7_new = 'Science' %}
126         {% elif data7 == '2' %}

```

```

128         {% set data7_new = 'Arts' %}
129     {% else %}
130         {% set data7_new = 'Not a valid response' %}
131     {% endif %}
132
133     {{ data7_new }}
134
135
136 </tr>
137 <tr>
138     <th scope="row">8</th>
139     <td>Degree Percentage</td>
140     <td>{{data8}}</td>
141
142 </tr>
143 <tr>
144     <th scope="row">9</th>
145     <td>Degree Subject/Stream</td>
146     <td>
147
148         {% if data9 == '0' %}
149             {% set data9_new = 'Commerce and Management' %}
150         {% elif data9 == '1' %}
151             {% set data9_new = 'Other' %}
152         {% elif data9 == '2' %}
153             {% set data9_new = 'Science and Technology' %}
154         {% else %}
155             {% set data9_new = 'Not a valid response' %}
156         {% endif %}
157
158         {{ data9_new }}
159
160
161     </td>
162
163 </tr>
164
165 <tr>
166     <th scope="row">10</th>
167     <td>Work Experience</td>
168     <td>
169         {% if data10 == '0' %}
170             {% set data10_new = 'No' %}
171         {% elif data10 == '1' %}
172             {% set data10_new = 'Yes' %}
173         {% else %}
174             {% set data10_new = 'Not a valid response' %}
175         {% endif %}
176
177         {{ data10_new }}
178
179     </td>
180
181 </tr>
182 <tr>
183     <th scope="row">11</th>

```

```

185     <td>AMCAT/Employblity Test Score</td>
186     <td>{{data11}}</td>
187 </tr>
188 <tr>
189     <th scope="row">12</th>
190     <td>MBA Specialisation</td>
191     <td>
192         {% if data12 == '0' %}
193             {% set data12_new = 'Finance and Marketing' %}
194         {% elif data12 == '1' %}
195             {% set data12_new = 'HR and Marketing' %}
196         {% else %}
197             {% set data12_new = 'Not a valid response' %}
198         {% endif %}
199
200         {{data12_new}}
201     </td>
202
203 </tr>
204 <tr>
205     <th scope="row">13</th>
206     <td>MBA Percentage</td>
207     <td>{{data13}}</td>
208
209 </tr>
210
211 <tr>
212     <th scope="row">14</th>
213     <td>Salary</td>
214     <td>{{data14}}</td>
215
216 </tr>
217
218
219 </tbody>
220 </table>
221
222
223
224
225 </body>
226
227 </html>

```

Output

RESULT

Congratulations!!!

You have high chances of getting placed

[Go back to home page](#)

Index	Information	Value
1	ID	1234
2	Gender	Male
3	Class 10th Marks	92
4	Class 10th Boards	Other
5	Class 12th Marks	85
6	Class 12th Boards	Central
7	Class 12th Subject/Stream	Science
8	Degree Percentage	75
9	Degree Subject/Stream	Science and Technology
10	Work Experience	Yes
11	AMCAT/Employblity Test Score	86
12	MBA Specialisation	HR and Marketing
13	MBA Percentage	0
14	Salary	25000

Step 4: App Code

app.py: This app.py creates a Flask web application to serve a machine learning model. Users input data through a form, and the code passes this data to the model to make predictions. The results are then displayed on a web page. The pickle library is used to load the pre-trained model, and Flask handles the web interface and routing.

Python3

```
1 from flask import Flask, render_template, request, redirect, url_for
2 import numpy as np
3 import pandas as pd
4 import pickle
5
6
7 model = pickle.load(open('placement.pkl', 'rb'))
8
```

```

app = Flask(__name__)

10
11
12 @app.route('/', methods=['GET', 'POST'])
13 def man():
14     return render_template('front.html')
15
16
17 @app.route('/predict', methods=['GET', 'POST'])
18 def home():
19     data1 = request.form['id']
20     data2 = request.form['gender']
21     data3 = request.form['marks1']
22     data4 = request.form['boards1']
23     data5 = request.form['marks2']
24     data6 = request.form['boards2']
25     data7 = request.form['strm']
26     data8 = request.form['deg_p']
27     data9 = request.form['deg_s']
28     data10 = request.form['wrx']
29     data11 = request.form['amcat']
30     data12 = request.form['sp']
31     data13 = request.form['mba_p']
32     data14 = request.form['sal']
33
34     arr = np.array([[data1, data2, data3, data4, data5, data6, data7, data8,
35                     data9, data10, data11, data12, data13, data14]])
36     pred = model.predict(arr)
37     return render_template('home.html', data=pred, data1=data1, data2=data2, data3=data1,
38                             data4=data4, data5=data5, data6=data6, data7=data7, data8=data8,
39                             data9=data9, data10=data10, data11=data11, data12=data12,
40                             data13=data13, data14=data14)
41
42
43 if __name__ == "__main__":
44     app.run(debug=True)

```

Step 5: Running the app on local host.

```
harmProjects\plac> python app.py
```

Just write "python app.py" on the terminal and this would be generated.

```

* Running on http://127.0.0.1:5000
Press CTRL+C to quit
* Restarting with stat
* Debugger is active!
* Debugger PIN: 662-780-665

```

After that just click on the "http://127.0.0.1:5000" and you would be redirected to a webpage, which would be the homepage of the application.

PLACEMENT PREDICTION

Just fill the given details and check your chances of getting placed.

Fill the details.

id

Gender

Class 10th Marks

Class 10th Boards

Class 12th Marks

Class 12th Boards

Class 12th Subject/Stream

Degree Percentage

Degree Subject/Stream

Work Experience

AMCAT/Employblity Test Score

Specialisation

MBA Percentage

Salary

predict!

app running on local host

After filling all the information click on predict.

Output

RESULT

Congratulations!!!

You have high chances of getting placed

[Go back to home page](#)

Index	Information	Value
1	ID	1234
2	Gender	Male
3	Class 10th Marks	92
4	Class 10th Boards	Other
5	Class 12th Marks	85
6	Class 12th Boards	Central
7	Class 12th Subject/Stream	Science
8	Degree Percentage	75
9	Degree Subject/Stream	Science and Technology
10	Work Experience	Yes
11	AMCAT/Employblity Test Score	86
12	MBA Specialisation	HR and Marketing
13	MBA Percentage	0
14	Salary	25000

Final Prediction

And your model is ready to predict.

Video Demonstration

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DevOps Roadmap

System Design

High Level Design
Low Level Design
UML Diagrams
Interview Guide
Design Patterns
OOAD
System Design Bootcamp

Interview Preparation

Competitive Programming
Top DS or Algo for CP
Company-Wise Recruitment Process
Company-Wise Preparation
Aptitude Preparation
Puzzles

Interview Questions

School Subjects

Mathematics
Physics
Chemistry
Biology
Social Science
English Grammar
Commerce
World GK

GeeksforGeeks Videos

DSA
Python
Java
C++
Web Development
Data Science
CS Subjects

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