

Week4: Deployment on Flask

Name : Sri Pallavi Chittimalla

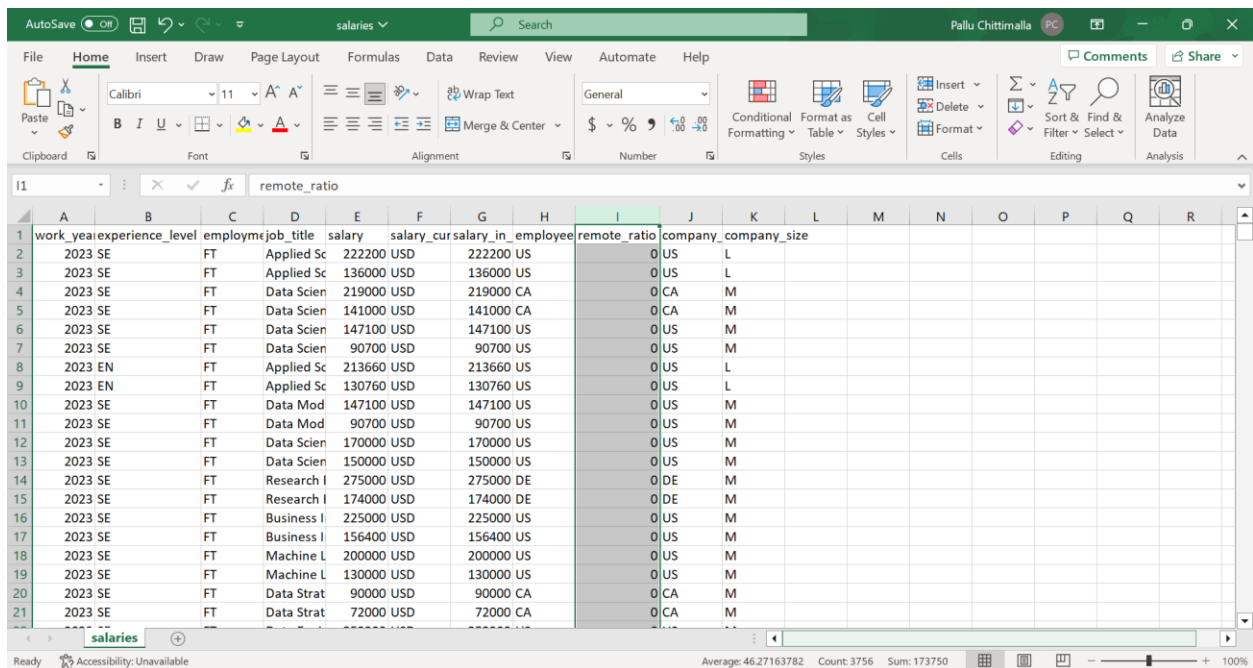
Batch : LISUM22(30 May, 2023 to 30 August, 2023)

Submission date : July 2, 2023

Submitted to :

Steps for deployment

1. Data used for modeling.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
	work_year	experience_level	employee_id	job_title	salary	salary_currency	salary_in_usd	remote_ratio	company	company_size								
2	2023	SE	FT	Applied Sc	222200	USD	222200	US	0	US	L							
3	2023	SE	FT	Applied Sc	136000	USD	136000	US	0	US	L							
4	2023	SE	FT	Data Scien	219000	USD	219000	CA	0	CA	M							
5	2023	SE	FT	Data Scien	141000	USD	141000	CA	0	CA	M							
6	2023	SE	FT	Data Scien	147100	USD	147100	US	0	US	M							
7	2023	SE	FT	Data Scien	90700	USD	90700	US	0	US	M							
8	2023	EN	FT	Applied Sc	213660	USD	213660	US	0	US	L							
9	2023	EN	FT	Applied Sc	130760	USD	130760	US	0	US	L							
10	2023	SE	FT	Data Mod	147100	USD	147100	US	0	US	M							
11	2023	SE	FT	Data Mod	90700	USD	90700	US	0	US	M							
12	2023	SE	FT	Data Scien	170000	USD	170000	US	0	US	M							
13	2023	SE	FT	Data Scien	150000	USD	150000	US	0	US	M							
14	2023	SE	FT	Research I	275000	USD	275000	DE	0	DE	M							
15	2023	SE	FT	Research I	174000	USD	174000	DE	0	DE	M							
16	2023	SE	FT	Business I	225000	USD	225000	US	0	US	M							
17	2023	SE	FT	Business I	156400	USD	156400	US	0	US	M							
18	2023	SE	FT	Machine L	200000	USD	200000	US	0	US	M							
19	2023	SE	FT	Machine L	130000	USD	130000	US	0	US	M							
20	2023	SE	FT	Data Strat	90000	USD	90000	CA	0	CA	M							
21	2023	SE	FT	Data Strat	72000	USD	72000	CA	0	CA	M							

2. Done the modeling in python jupyter Notebook(ipynb)

3. Save the model in pickle

localhost8888/notebooks/Salary_Regression.ipynb

Jupyter Salary_Regression Last Checkpoint: Last Wednesday at 6:18 PM (unsaved changes)

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3 (ipykernel)

	Model	MAE	MSE	RMSE	R2 Score
1	Gradient Boosting	44123.797954	3234642936.282585	56873.921408	0.252771
0	Random Forest	44600.846703	3306069085.341588	57498.426808	0.236271
3	Decision Tree	44790.385398	3397714296.68983	58289.915909	0.2151
2	KNN	49674.538445	3921814064.956081	62624.388739	0.094029

```
In [26]: mymodel = DecisionTreeRegressor()
mymodel.fit(X_train, y_train)

Out[26]: DecisionTreeRegressor()

In [27]: import pickle

# Assuming the model is stored in the 'model' variable
with open('mymodel.pkl', 'wb') as f:
    pickle.dump(mymodel, f)

In [ ]:

In [29]: mymodel.predict([[ '2021', '3', '55', '350' ]])

C:\Users\pallu\anaconda3\lib\site-packages\sklearn\base.py:450: UserWarning: X does not have valid feature names, but DecisionTreeRegressor was fitted with feature names
  warnings.warn(

Out[29]: array([94544.81818182])
```

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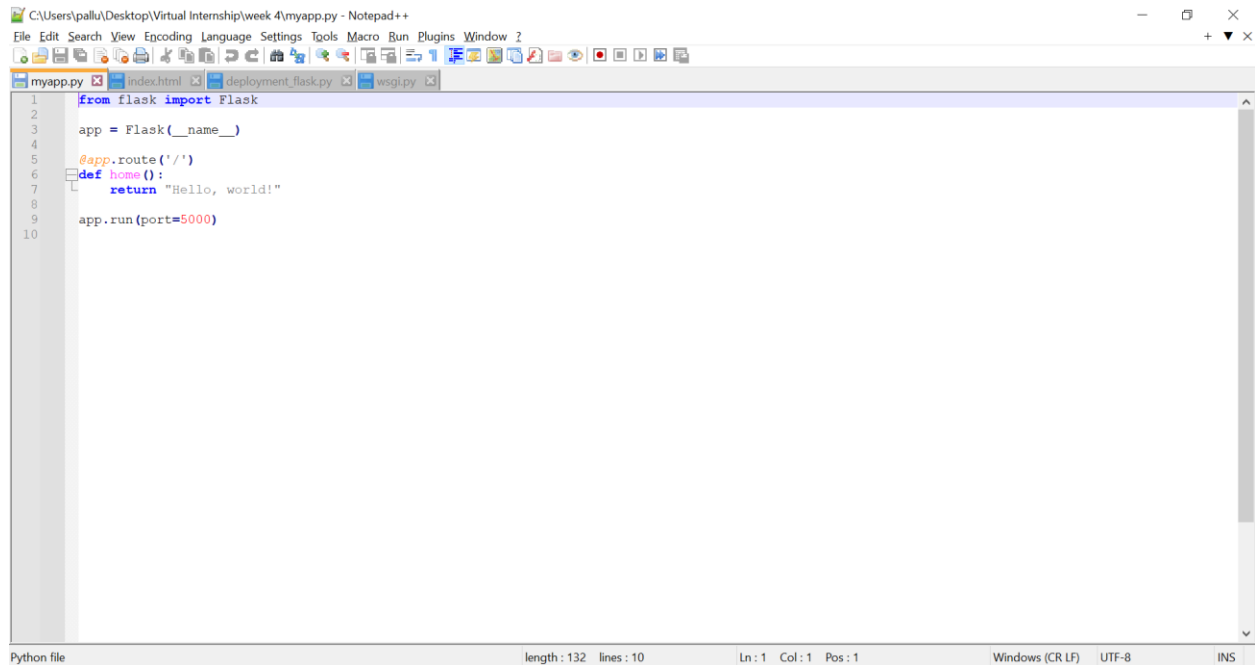
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39 items 1 item selected 15.3 KB

4. App is for example

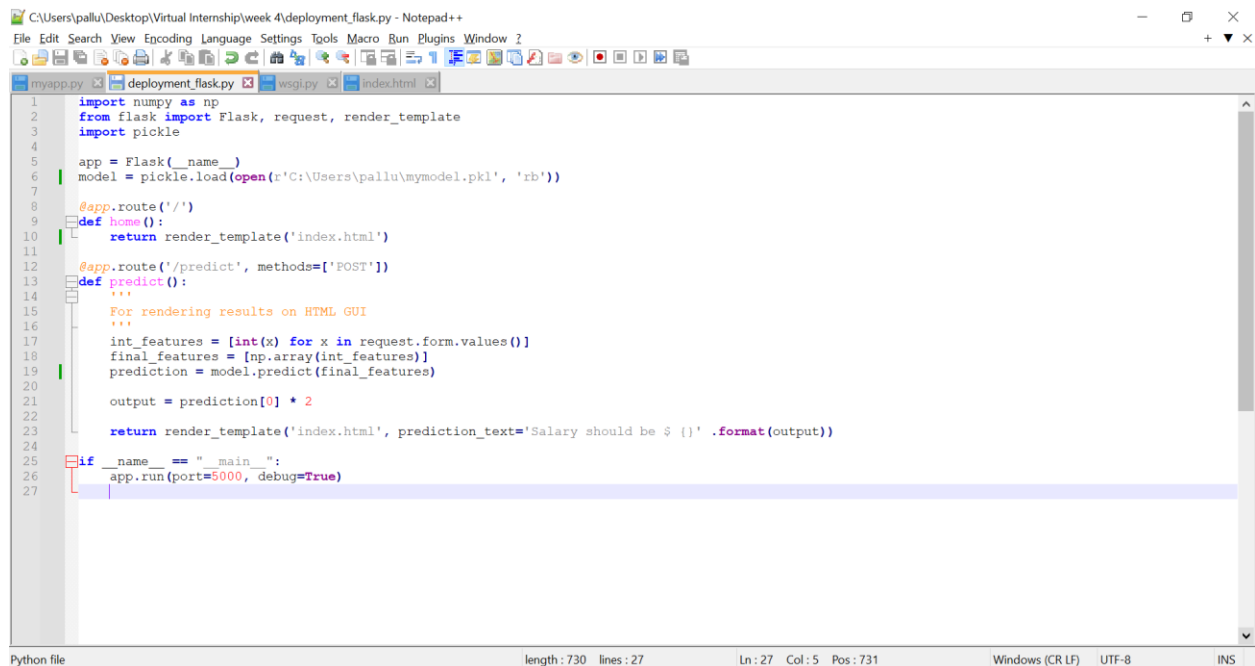


A screenshot of a Notepad++ window titled "C:\Users\pallu\Desktop\Virtual Internship\week 4\myapp.py - Notepad++". The window shows a Python file named "myapp.py" with the following code:

```
1 from flask import Flask
2
3 app = Flask(__name__)
4
5 @app.route('/')
6 def home():
7     return "Hello, world!"
8
9 app.run(port=5000)
10
```

The status bar at the bottom indicates: Python file, length: 132, lines: 10, Ln: 1, Col: 1, Pos: 1, Windows (CR LF), UTF-8, INS.

5. Flask



A screenshot of a Notepad++ window titled "C:\Users\pallu\Desktop\Virtual Internship\week 4\deployment_flask.py - Notepad++". The window shows a Python file named "deployment_flask.py" with the following code:

```
1 import numpy as np
2 from flask import Flask, request, render_template
3 import pickle
4
5 app = Flask(__name__)
6 model = pickle.load(open(r'C:\Users\pallu\mymodel.pkl', 'rb'))
7
8 @app.route('/')
9 def home():
10     return render_template('index.html')
11
12 @app.route('/predict', methods=['POST'])
13 def predict():
14     """
15     For rendering results on HTML GUI
16     """
17     int_features = [int(x) for x in request.form.values()]
18     final_features = [np.array(int_features)]
19     prediction = model.predict(final_features)
20
21     output = prediction[0] * 2
22
23     return render_template('index.html', prediction_text='Salary should be $ {}'.format(output))
24
25 if __name__ == "__main__":
26     app.run(port=5000, debug=True)
27
```

The status bar at the bottom indicates: Python file, length: 730, lines: 27, Ln: 27, Col: 5, Pos: 731, Windows (CR LF), UTF-8, INS.

6. HTML file

```
C:\Users\pallu\Desktop\Virtual Internship\week 4\templates\index.html - Notepad++
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
myapp.py deployment Flask.py wsgi.py index.html
1 <!DOCTYPE html>
2 <html>
3 <head>
4 <meta charset="UTF-8">
5 <title>ML API</title>
6 </head>
7 <body>
8 <div class = "login">
9 <h1>Predict Salary</h1>
10 <form action="{{ url_for('predict')}}" method="post">
11
12 <input type="text" name="work_year" placeholder="Work Year" required="required" />
13 <input type="text" name="experience_level" placeholder="Experience Level" required="required" />
14 <input type="text" name="remote_ratio" placeholder="Remote ratio" required="required" />
15 <input type="text" name="company_size" placeholder="Company Size" required="required" />
16
17 <button type="submit" class="btn btn-primary btn-block btn-large value="Submit">Predict</button>
18 </form>
19
20 <br>
21 <br>
22 {{ prediction_text }}
23
24 </div>
25
26 </body>
27 </html>
```

7. Run through bash

```
MINGW64:/c/Users/pallu/Desktop/Virtual Internship/week 4
C:\Users\pallu\AppData\Local\Programs\Python\Python311\Lib\site-packages\sklearn\base.py
:318: UserWarning: Trying to unpickle estimator DecisionTreeRegressor from version 1.0.2
when using version 1.2.2. This might lead to breaking code or invalid results. Use at y
our own risk. For more info please refer to:
https://scikit-learn.org/stable/model_persistence.html#security-maintainability-limitati
ons
warnings.warn(
* Debugger is active!
* Debugger PIN: 130-784-231
C:\Users\pallu\AppData\Local\Programs\Python\Python311\Lib\site-packages\sklearn\base.py
:439: UserWarning: X does not have valid feature names, but DecisionTreeRegressor was fi
tted with feature names
warnings.warn(
127.0.0.1 - - [29/Jun/2023 17:54:08] "POST /predict HTTP/1.1" 200 -
C:\Users\pallu\AppData\Local\Programs\Python\Python311\Lib\site-packages\sklearn\base.py
:439: UserWarning: X does not have valid feature names, but DecisionTreeRegressor was fi
tted with feature names
warnings.warn(
127.0.0.1 - - [29/Jun/2023 17:54:16] "POST /predict HTTP/1.1" 200 -
127.0.0.1 - - [29/Jun/2023 17:54:47] "GET / HTTP/1.1" 200 -
C:\Users\pallu\AppData\Local\Programs\Python\Python311\Lib\site-packages\sklearn\base.py
:439: UserWarning: X does not have valid feature names, but DecisionTreeRegressor was fi
tted with feature names
warnings.warn(
127.0.0.1 - - [29/Jun/2023 17:55:01] "POST /predict HTTP/1.1" 200 -
```

```
MINGW64:/c/Users/pallu/Desktop/Virtual Internship/week 4
* Serving Flask app 'deployment_flask'
* Debug mode: on
WARNING: This is a development server. Do not use it in a production deployment.
Use a production WSGI server instead.
* Running on http://127.0.0.1:5000
Press CTRL+C to quit
* Restarting with stat
C:\Users\pallu\AppData\Local\Programs\Python\Python311\Lib\site-packages\sklearn
\base.py:318: UserWarning: Trying to unpickle estimator DecisionTreeRegressor fr
om version 1.0.2 when using version 1.2.2. This might lead to breaking code or i
nvalid results. Use at your own risk. For more info please refer to:
https://scikit-learn.org/stable/model_persistence.html#security-maintainability-
limitations
  warnings.warn(
* Debugger is active!
* Debugger PIN: 130-784-231
127.0.0.1 - - [03/Jul/2023 14:30:46] "GET / HTTP/1.1" 200 -
127.0.0.1 - - [03/Jul/2023 14:30:47] "GET /favicon.ico HTTP/1.1" 404 -
C:\Users\pallu\AppData\Local\Programs\Python\Python311\Lib\site-packages\sklearn
\base.py:439: UserWarning: X does not have valid feature names, but DecisionTree
Regressor was fitted with feature names
  warnings.warn(
127.0.0.1 - - [03/Jul/2023 14:31:04] "POST /predict HTTP/1.1" 200 -
```

8. Web page

localhost

ML API

File | C:/Users/pallu/Desktop/Virtual%20Internship/week%204/templates/index.html

Predict Salary

Work Year

Experience Level

Remote ratio

Company Size

Predict

{{ prediction_text }}

9. Output with Predicted Salary

localhost

ML API

+

←

→

↻

127.0.0.1:5000/predict

🔗

☆

⚙️

☰

🖨️

🔍

Predict Salary

2021

3

65

500

Predict

Salary should be \$ 189089.63636363635