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BATCH CODE: LISUM19

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Building the machine learning model and deploying it on Flask:

1. Importing libraries and loading the dataset

```
In [1]: 1 # Importing the libraries
        2 import numpy as np
        3 import pandas as pd
        4 import pickle
```

```
In [2]: 1 dataset = pd.read_csv('price.csv')
        2 dataset
```

```
Out[2]:
```

	bed_room	area	house_age	price
0	NaN	2300.0	9	50000
1	NaN	2152.0	6	45000
2	five	8520.0	7	60000
3	two	9025.0	10	65000
4	seven	9900.0	6	70000
5	three	8045.0	10	62000
6	ten	9564.0	7	72000
7	eleven	NaN	8	80000

2. Filling the null values of bed_room column with '0' and area with 'mean'. Then converting the words in the bed_room column to integer values for ease in building a ML algorithm

```
In [3]: 1 dataset['bed_room'].fillna(0, inplace=True)
        2
        3 dataset['area'].fillna(dataset['area'].mean(), inplace=True)
        4
        5 X = dataset.iloc[:, :3]
```

```
In [4]: 1 #Converting words to integer values
        2 def convert_to_int(word):
        3     word_dict = {'one':1, 'two':2, 'three':3, 'four':4, 'five':5, 'six':6, 'seven':7, 'eight':8,
        4               'nine':9, 'ten':10, 'eleven':11, 'twelve':12, 'zero':0, 0: 0}
        5     return word_dict[word]
        6
        7 X['bed_room'] = X['bed_room'].apply(lambda x : convert_to_int(x))
        8
        9 y = dataset.iloc[:, -1]
```

3. Creating an instance/object of Linear Regression and training the model. Then saving the model to disk as a pickle file.

```
In [14]: 1 from sklearn.linear_model import LinearRegression
2 regressor = LinearRegression()
3
4 #Fitting model with trainig data
5 regressor.fit(X, y)
6
7 # Saving model to disk
8 pickle.dump(regressor, open('model.pkl','wb'))
9
10 # Loading model to compare the results
11 model = pickle.load(open('model.pkl','rb'))
12 print(model.predict([[5, 2150, 6]]))

[56050.91893625]
```

4. Creating a app.py file to import the pickle object created before and following below steps:
 - a. Using the index.html template to a format or interface to input the values.
 - b. Creating the predict function which takes the input values from the users and predicts values based on the backend Linear Regression model.
 - c. Outputting the value through the same index template which shows the result.

```
1 import numpy as np
2 from flask import Flask, request, render_template
3 import pickle
4 app = Flask(__name__)
5 model = pickle.load(open('model.pkl', 'rb'))
6 @app.route('/')
7 def home():
8     return render_template('index.html')
9
10 @app.route('/predict', methods=['POST'])
11 def predict():
12     int_features = [int(x) for x in request.form.values()]
13     final_features = [np.array(int_features)]
14     prediction = model.predict(final_features)
15     output = round(prediction[0], 2)
16     return render_template('index.html', prediction_text='House price should be $ {}'.format(output))
17
18 if __name__ == "__main__":
19     app.run(debug=True)
```

5. In the command Prompt, running the app.py script.

```
C:\Windows\System32\cmd.exe - python app.py

C:\Users\snigdha.chigurupati\Downloads\Data-Glacier\Week 4>python app.py
C:\Users\snigdha.chigurupati\AppData\Local\Packages\PythonSoftwareFoundation.Python.3.10_qbz5n2kfra8p0\LocalCache\local-
packages\Python310\site-packages\sklearn\base.py:318: UserWarning: Trying to unpickle estimator LinearRegression from ve
rsion 0.24.2 when using version 1.2.2. This might lead to breaking code or invalid results. Use at your own risk. For mo
re info please refer to:
https://scikit-learn.org/stable/model_persistence.html#security-maintainability-limitations
warnings.warn(
* Serving Flask app 'app'
* 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\snigdha.chigurupati\AppData\Local\Packages\PythonSoftwareFoundation.Python.3.10_qbz5n2kfra8p0\LocalCache\local-
packages\Python310\site-packages\sklearn\base.py:318: UserWarning: Trying to unpickle estimator LinearRegression from ve
rsion 0.24.2 when using version 1.2.2. This might lead to breaking code or invalid results. Use at your own risk. For mo
re info please refer to:
https://scikit-learn.org/stable/model_persistence.html#security-maintainability-limitations
warnings.warn(
* Debugger is active!
* Debugger PIN: 132-510-972
```

6. Copy and paste the URL in a new window to get the below interface:



Predict House Price

<input type="text" value="Number of Rooms"/>	<input type="text" value="Area (in square feet)"/>	<input type="text" value="House Age"/>	<input type="button" value="Predict"/>
--	--	--	--

7. Now, giving the input values and clicking on predict to get the predicted house price:
Input values – Number of Rooms – 5, Area – 2150, House Age -6



127.0.0.1:5000/predict



Favourites



AWS



Python

Predict House Price

House price should be \$ 56050.92