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BATCH CODE: LISUM19

Submission Date: 3/29/2023

Building the machine learning model and deploying it on Heroku:

1. Importing libraries and loading the dataset

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

In [2]:
```
dataset = pd.read_csv('price.csv')
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]:
```
dataset['bed_room'].fillna(0, inplace=True)

dataset['area'].fillna(dataset['area'].mean(), inplace=True)

X = dataset.iloc[:, :3]
```

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

X['bed_room'] = X['bed_room'].apply(lambda x : convert_to_int(x))

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]:

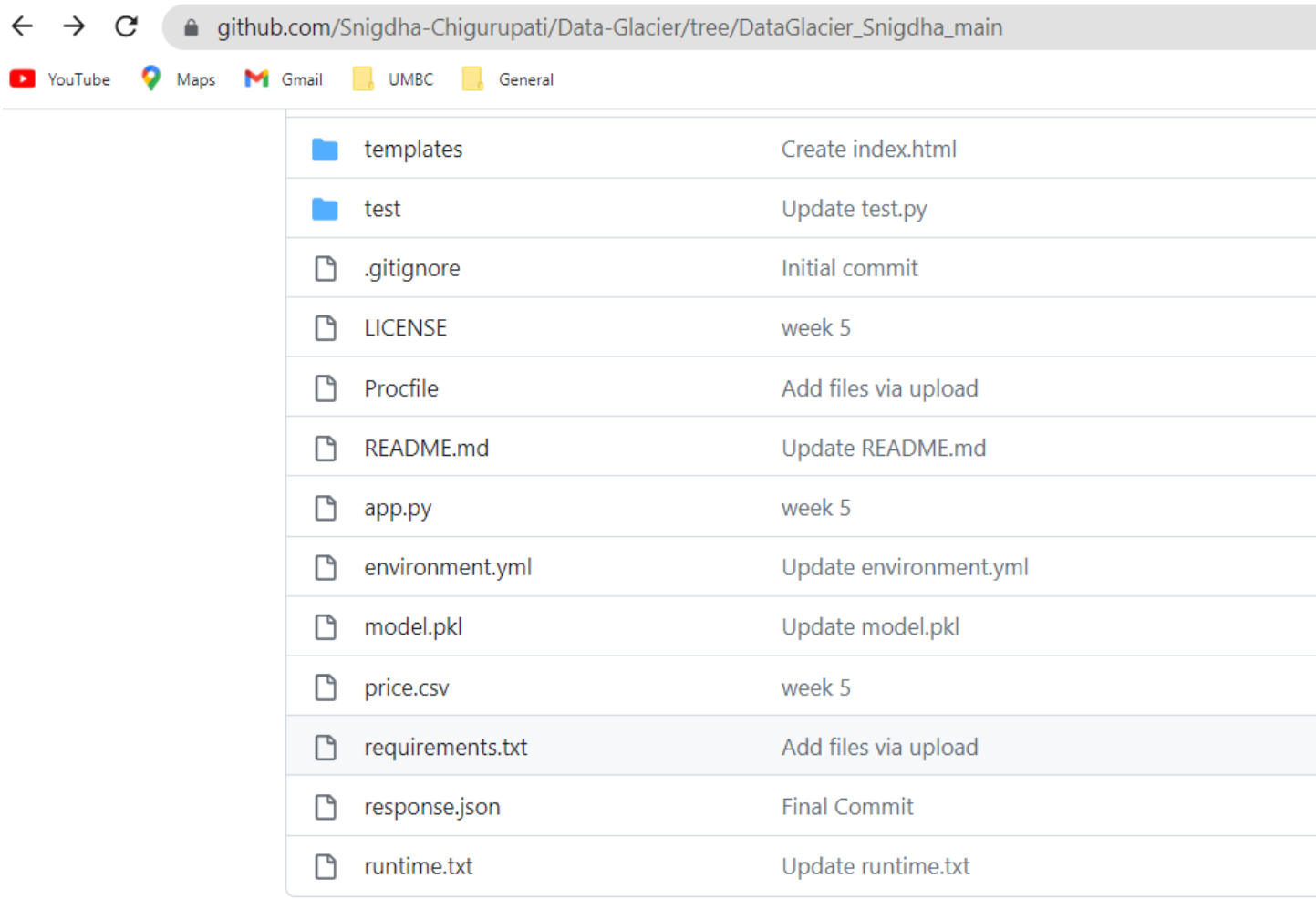
```
from sklearn.linear_model import LinearRegression
regressor = LinearRegression()

#Fitting model with trainig data
regressor.fit(X, y)

# Saving model to disk
pickle.dump(regressor, open('model.pkl','wb'))

# Loading model to compare the results
model = pickle.load(open('model.pkl','rb'))
print(model.predict([[5, 2150, 6]]))
```

```
[56050.91893625]
```

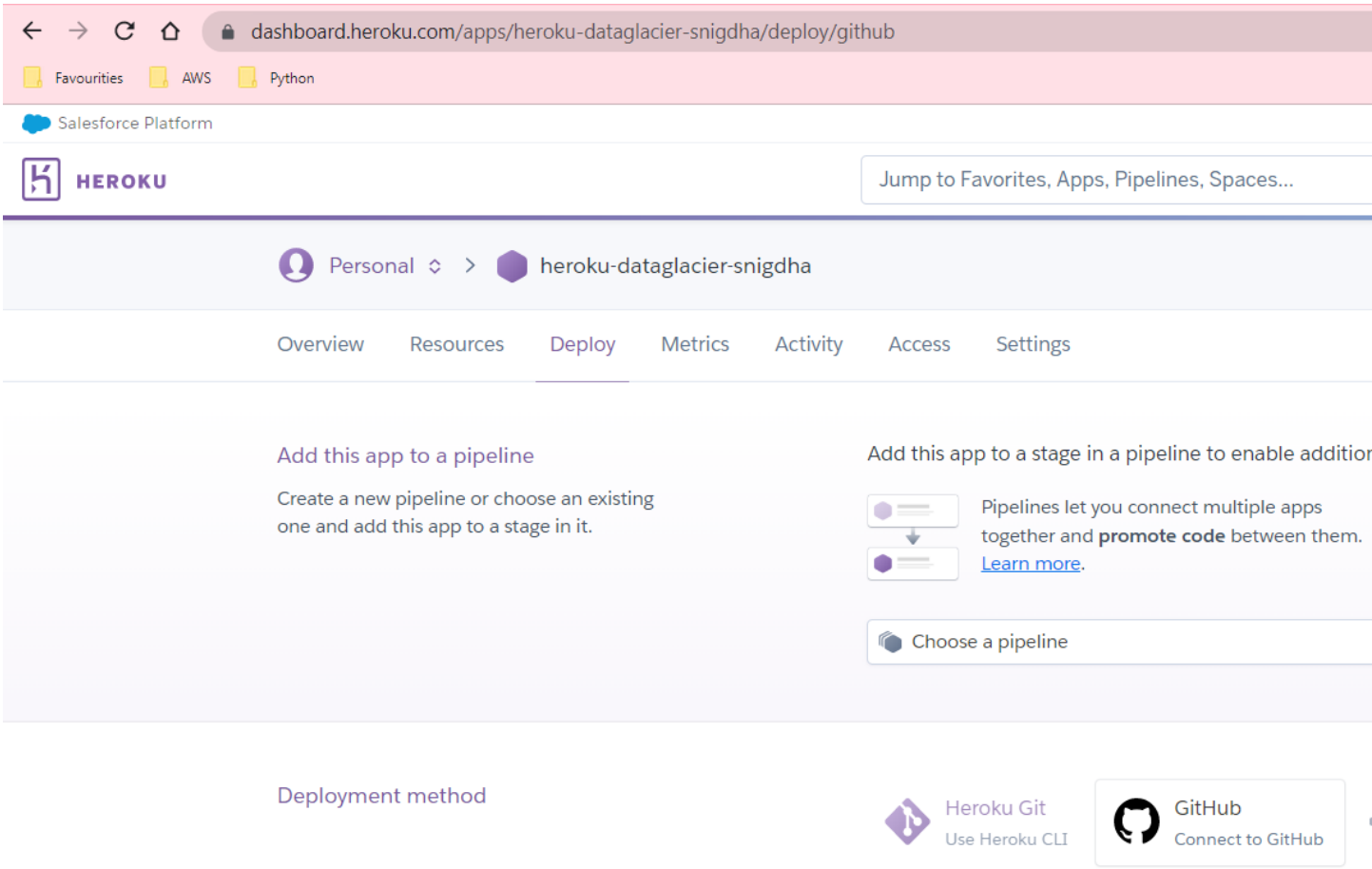
4. Creating a app.py file to import the pickle object created before and following below steps:
    a. Using the index.html template to a format or interface to input the values.
    b. Creating the predict function which takes the input values from the users and predicts values based on the backend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

```
import numpy as np
from flask import Flask, request,render_template
import pickle
app = Flask(__name__)
model = pickle.load(open('model.pkl', 'rb'))
@app.route('/')
def home():
    return render_template('index.html')

@app.route('/predict',methods=['POST'])
def predict():
    int_features = [int(x) for x in request.form.values()]
    final_features = [np.array(int_features)]
    prediction = model.predict(final_features)
    output = round(prediction[0], 2)
    return render_template('index.html', prediction_text='House price should be $ {}'.format(output))

if __name__ == "__main__":
    app.run(debug=True)
```

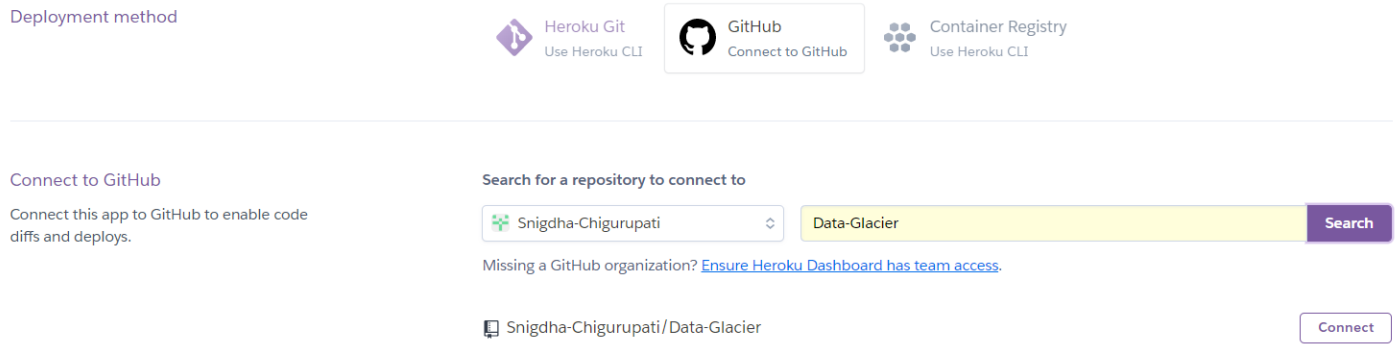
5. Pushing the all the files such as Procfile, requirements, pickle file etc. and code to github account.



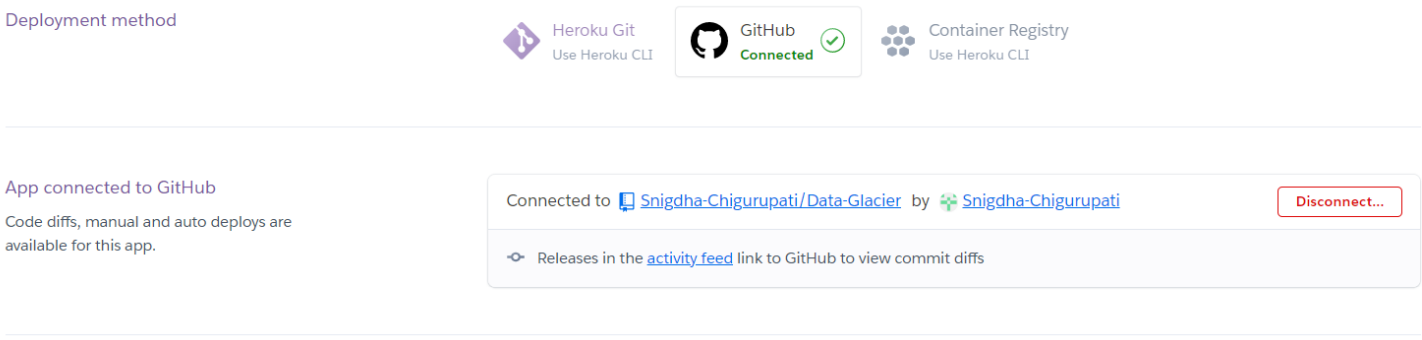
6. Now, creating a Heroku account and creating an app (with name ‘heroku-dataglacier-snigdha’) after downloading salesforce authenticator app from app store and providing the payment details. Now, under the ‘deploy’ tab, select deployment method as Github.



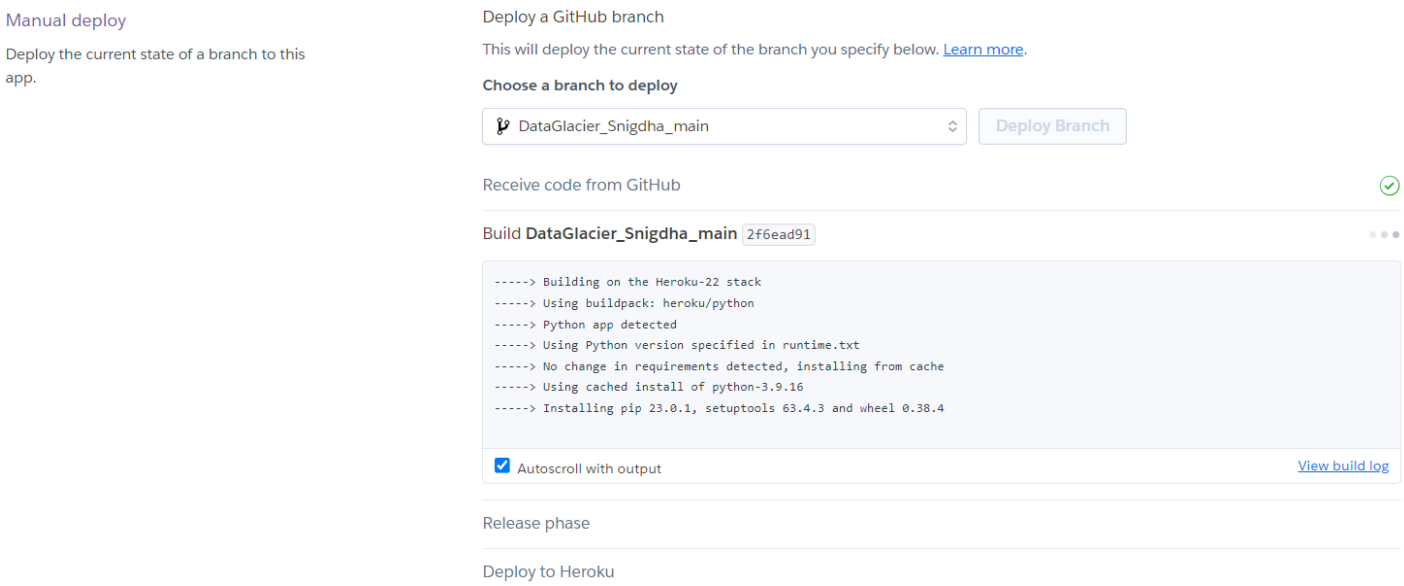
7. Below, in the connect to github section, search for the repository that needs to be connected and click on connect.



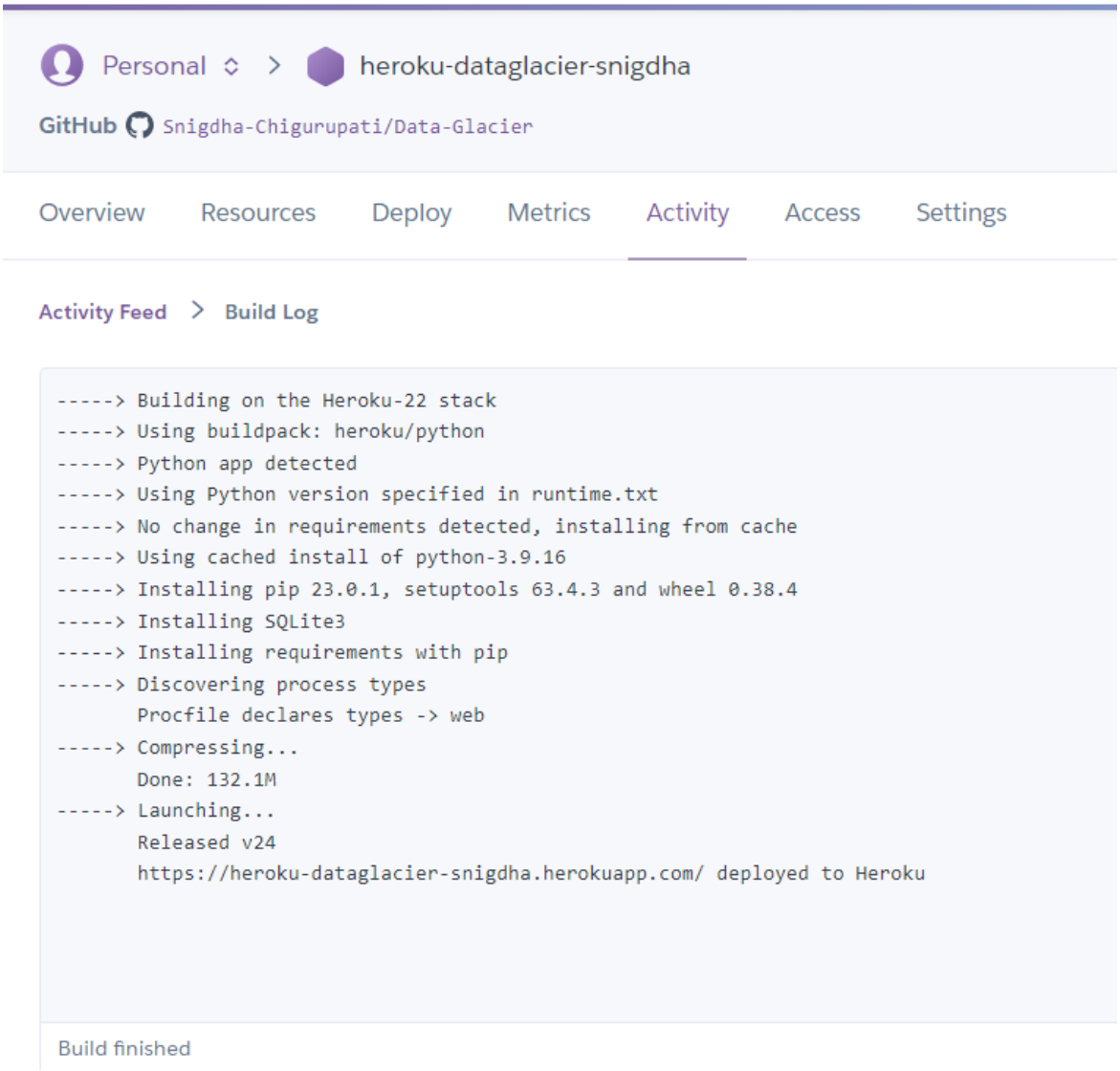
8. It is now connected to the repository.



9. In the manual deployment, select the branch which has the files and code and click on deploy branch.

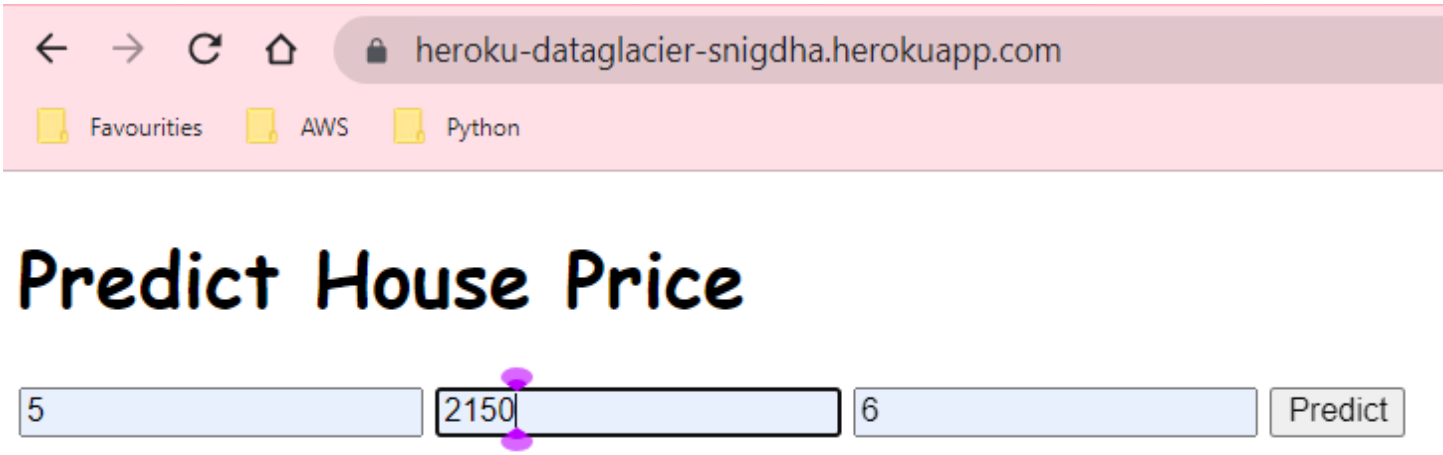


10. Click on view build log to get the link to the deployment server and check the logs.



11. Now, copy and paste the link in a new window to get the below:

12. Now, giving the input values :Input values – Number of Rooms – 5, Area – 2150, House Age -6



13. Click on predict to get the predicted house price: