

# Model development on Flask

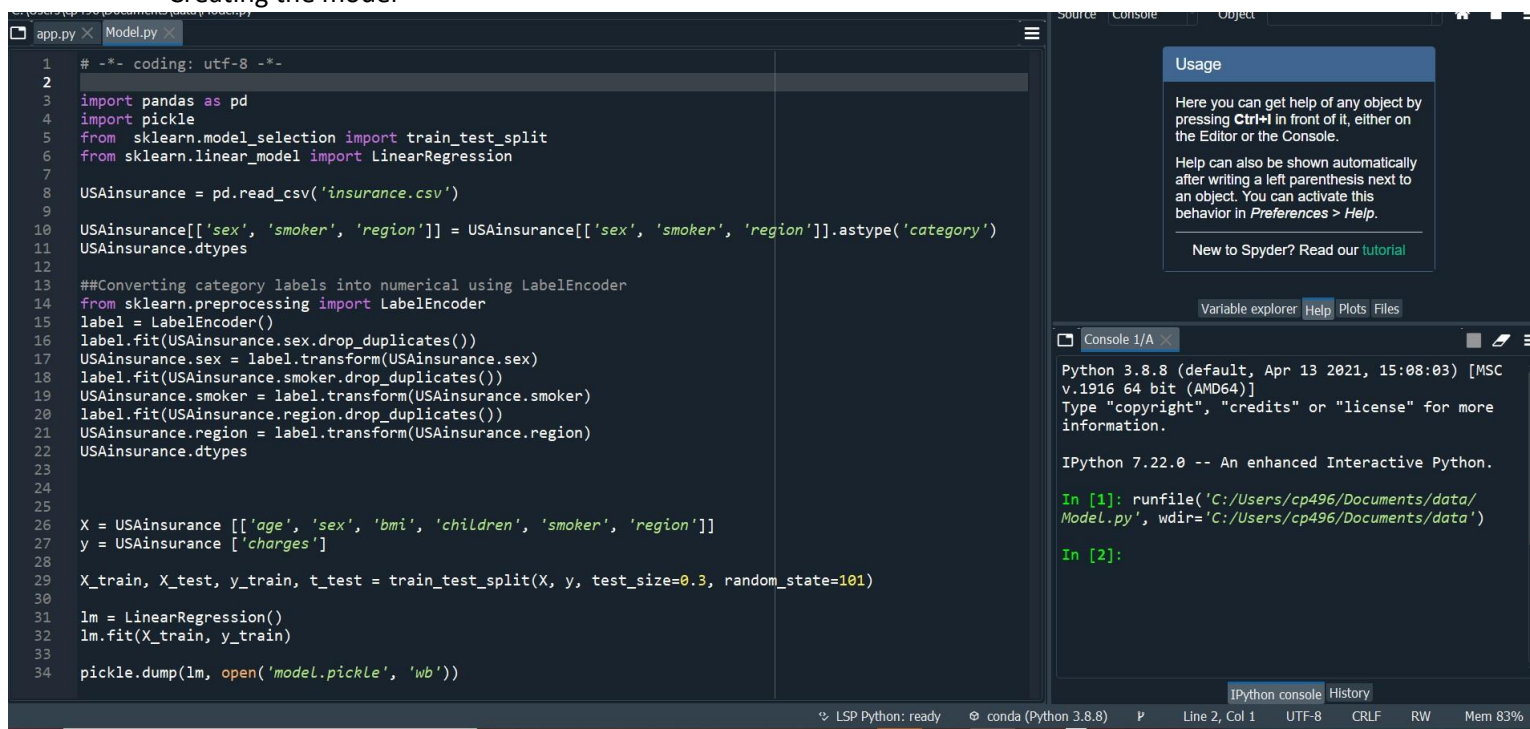
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Batch Code: LISUM02

Submission Date: 22/08/2021

Submission To: Data Glacier

## Creating the model



```
1 # -*- coding: utf-8 -*-
2
3 import pandas as pd
4 import pickle
5 from sklearn.model_selection import train_test_split
6 from sklearn.linear_model import LinearRegression
7
8 USAinsurance = pd.read_csv('insurance.csv')
9
10 USAinsurance[['sex', 'smoker', 'region']] = USAinsurance[['sex', 'smoker', 'region']].astype('category')
11 USAinsurance.dtypes
12
13 ##Converting category labels into numerical using LabelEncoder
14 from sklearn.preprocessing import LabelEncoder
15 label = LabelEncoder()
16 label.fit(USAinsurance.sex.drop_duplicates())
17 USAinsurance.sex = label.transform(USAinsurance.sex)
18 label.fit(USAinsurance.smoker.drop_duplicates())
19 USAinsurance.smoker = label.transform(USAinsurance.smoker)
20 label.fit(USAinsurance.region.drop_duplicates())
21 USAinsurance.region = label.transform(USAinsurance.region)
22 USAinsurance.dtypes
23
24
25
26 X = USAinsurance[['age', 'sex', 'bmi', 'children', 'smoker', 'region']]
27 y = USAinsurance['charges']
28
29 X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.3, random_state=101)
30
31 lm = LinearRegression()
32 lm.fit(X_train, y_train)
33
34 pickle.dump(lm, open('model.pickle', 'wb'))
```

Usage

Here you can get help of any object by pressing **Ctrl+H** in front of it, either on the Editor or the Console.

Help can also be shown automatically after writing a left parenthesis next to an object. You can activate this behavior in *Preferences > Help*.

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Variable explorer Help Plots Files

Console 1/A

Python 3.8.8 (default, Apr 13 2021, 15:08:03) [MSC v.1916 64 bit (AMD64)]  
Type "copyright", "credits" or "license" for more information.

IPython 7.22.0 -- An enhanced Interactive Python.

In [1]: runfile('C:/Users/cp496/Documents/data/Model.py', wdir='C:/Users/cp496/Documents/data')

In [2]:

LSP Python: ready conda (Python 3.8.8) P Line 2, Col 1 UTF-8 CRLF RW Mem 83%

## Creating the app

```
C:\Users\cp496\Documents\data\app.py
app.py Model.py
1 # Creating Flask app for model deployment
2 import numpy as np
3 from flask import Flask, jsonify, request, render_template
4 import pickle
5
6 app = Flask(__name__)
7
8 # Root endpoint
9 @app.route('/', methods = ['GET', 'POST'])
10 def home():
11     return render_template('index.html')
12
13 # Predict endpoint
14 @app.route('/predict', methods = ['POST'])
15 def predict():
16     model = pickle.load(open('model.pickle', 'rb'))
17
18     int_features = [int(x) for x in request.form.values()]
19     final_features = [np.array(int_features)]
20     prediction_lep = model.predict(final_features)
21
22     output = round(prediction_lep[0], 3)
23
24     return render_template('index.html', prediction_text='Insurance charge should be $ {}'.format(output))
25
26
27
28
29 if __name__ == "__main__":
30     app.run(port = 5000, debug = True)
```

## Design of the page

```
<!DOCTYPE html>
<html >
<!--From https://codepen.io/frytyler/pen/EGdtg-->
<head>
  <meta charset="UTF-8">
  <title>Chandni ML API</title>
  <link href='https://fonts.googleapis.com/css?family=Pacifico' rel='stylesheet' type='text/css'>
  <link href='https://fonts.googleapis.com/css?family=Arimo' rel='stylesheet' type='text/css'>
  <link href='https://fonts.googleapis.com/css?family=Hind:300' rel='stylesheet' type='text/css'>
  <link href='https://fonts.googleapis.com/css?family=Open+Sans+Condensed:300' rel='stylesheet' type='text/css'>
  <link rel="stylesheet" href="{{ url_for('static', filename='css/style.css') }}">
</head>

<body>
  <div class="predict">
    <h1>Predicting insurance charge</h1>

    <!-- Main Input For Receiving Query to our ML -->
    <form action="{{ url_for('predict') }}" method="post">

      <p>Age</p>
      <input type="text" name="age" placeholder="age 18 or over" required="required" />
      <br></br>

      <p>Sex</p>
      <select id="sex" class="select" name="sex" placeholder="sex" required="required">
        <option value="0">Female</option>
        <option value="1">Male</option>
      </select>
      <br></br>

      <p>Children</p>
      <input type="text" name="children" placeholder="children" required="required" />
    </form>
  </div>
</body>
</html>
```

```

<p>Children</p>
<input type="text" name="children" placeholder="children" required="required" />
<br></br>

<p>BMI</p>
<input type="text" name="bmi" placeholder="bmi" required="required" />
<br></br>

<p>Smoker</p>
<select id="smoker" class="select" name="smoker" placeholder="smoker" required="required">
<option value="1">Yes</option>
<option value="0">No</option>
</select>
<br></br>

<p>region</p>
<select id="region" class="select" name="region" placeholder="region" required="required">
<option value="3">South West</option>
<option value="2">South East</option>
<option value="1">North West</option>
<option value="0">North East</option>
</select>

<br></br>

<button type="submit" class="btn btn-primary btn-block btn-large">Predict</button>
</form>

<br>
<br>
{{ prediction_text }}

</div>

```

## Generate Procfile and requirement.txt:

flask\_app


Share

View


This PC > Documents > flask\_app

	Name	Date modified	Type	Size
ss	<div><div></div>model</div>	20/08/2021 12:54	File folder	
ds	<div><div></div>static</div>	20/08/2021 12:54	File folder	
ts	<div><div></div>templates</div>	20/08/2021 12:54	File folder	
	<div><div></div>.gitattributes</div>	20/08/2021 12:33	Text Document	1 KB
	<div><div></div>model.pickle</div>	15/08/2021 09:59	PICKLE File	1 KB
	<div><div></div>Procfile</div>	20/08/2021 12:54	File	1 KB
	<div><div></div>README.md</div>	20/08/2021 12:54	MD File	1 KB
s	<div><div></div>requirements</div>	20/08/2021 12:54	Text Document	1 KB
	<div><div></div>script</div>	15/08/2021 10:26	Python File	1 KB

## Deploy to HEROKU:

 **HEROKU**

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### Add this app to a pipeline

Create a new pipeline or choose an existing one and add this app to a stage in it.

### Add this app to a stage in a pipeline to enable additional features




Pipelines let you connect multiple apps together and **promote code** between them. [Learn more.](#)





Pipelines connected to GitHub can enable **review apps**, and create apps for new pull requests. [Learn more.](#)

Choose a pipeline













### Deployment method

 Heroku Git  
Use Heroku CLI

 GitHub  
Connect to GitHub

 Container Registry  
Use Heroku CLI

## Activity Feed

-   **cpatel521351@hotmail.com:** Deployed `65b442ec`  
Aug 20 at 1:07 PM · v4
-   **cpatel521351@hotmail.com:** Build succeeded  
Aug 20 at 1:06 PM · [View build log](#)
-   **cpatel521351@hotmail.com:** Deployed `9f18ff01`  
Aug 20 at 1:06 PM · v3 · [Roll back to here](#)
-   **cpatel521351@hotmail.com:** Build succeeded  
Aug 20 at 1:05 PM · [View build log](#)
-   **cpatel521351@hotmail.com:** Enable Logplex  
Aug 20 at 12:59 PM · v2 · [Roll back to here](#)
-   **cpatel521351@hotmail.com:** Initial release  
Aug 20 at 12:59 PM · v1 · [Roll back to here](#)



Open app

More

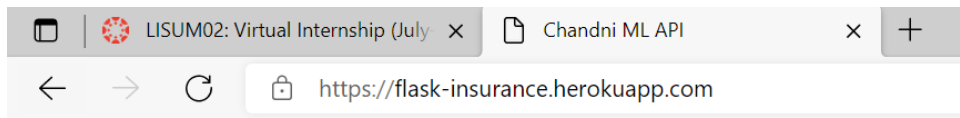
## Application Logs

ALL PROCESSES

```
fwd="87.80.172.192" dyno=web.1 connect=0ms service=3ms status=405 bytes=370 protocol=https
2021-08-22T13:36:22.132638+00:00 app[web.1]: /app/.heroku/python/lib/python3.9/site-packages/sklearn/base.py:310: UserWarning: Trying to unpickle estimator LinearRegression from
version 0.24.1 when using version 0.24.2. This might lead to breaking code or invalid results. Use at your own risk.
2021-08-22T13:36:22.132647+00:00 app[web.1]: warnings.warn(
2021-08-22T13:36:22.139488+00:00 app[web.1]: 10.1.2.143 - - [22/Aug/2021:13:36:22 +0000] "POST /predict HTTP/1.1" 200 2152 "https://flask-insurance.herokuapp.com/" "Mozilla/5.0
(Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/92.0.4515.159 Safari/537.36 Edg/92.0.902.78"
2021-08-22T13:36:22.140704+00:00 heroku[router]: at=info method=POST path="/predict" host=flask-insurance.herokuapp.com request_id=c91ab223-7fe7-458e-892b-3b6f389be261
fwd="87.80.172.192" dyno=web.1 connect=0ms service=1894ms status=200 bytes=2307 protocol=https
2021-08-22T13:36:22.325391+00:00 app[web.1]: 10.1.2.143 - - [22/Aug/2021:13:36:22 +0000] "GET /static/css/style.css HTTP/1.1" 404 232 "https://flask-
insurance.herokuapp.com/predict" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/92.0.4515.159 Safari/537.36 Edg/92.0.902.78"
2021-08-22T13:36:22.326607+00:00 heroku[router]: at=info method=GET path="/static/css/style.css" host=flask-insurance.herokuapp.com request_id=769abe2a-f164-4c13-b17d-
a7048f84afeb fwd="87.80.172.192" dyno=web.1 connect=0ms service=2ms status=404 bytes=393 protocol=https
Disconnected from log stream. There may be events happening that you do not see here! Attempting to reconnect...
Connection to log stream failed. Please try again later.
```

☒ Autoscroll with output

Save



# Predicting insurance charge

Age

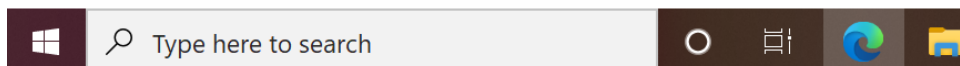
Sex

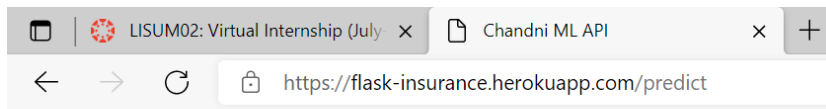
Children

BMI

Smoker

region





## Predicting insurance charge

Age

Sex

Children

BMI

Smoker

region

Insurance charge should be \$ 9008.24

