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Code

JupyterLab Python 3 (ipykernel)

[1]:
```
import numpy as np
import matplotlib.pyplot as plt
import pandas as pd
```

[9]:
```
data=pd.read_csv('insurance_pre.csv')
```

[12]:
```
data
```

[12]:

	age	sex	bmi	children	smoker	charges
0	19	female	27.900	0	yes	16884.92400
1	18	male	33.770	1	no	1725.55230
2	28	male	33.000	3	no	4449.46200
3	33	male	22.705	0	no	21984.47061
4	32	male	28.880	0	no	3866.85520
...	...	...	...	...	...	...
1333	50	male	30.970	3	no	10600.54830
1334	18	female	31.920	0	no	2205.98080
1335	18	female	36.850	0	no	1629.83350
1336	21	female	25.800	0	no	2007.94500

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JupyterLab

Python 3 (ipykernel)

1338 rows × 6 columns

[14]:
```
data.head()
```

[14]:

	age	sex	bmi	children	smoker	charges
0	19	female	27.900	0	yes	16884.92400
1	18	male	33.770	1	no	1725.55230
2	28	male	33.000	3	no	4449.46200
3	33	male	22.705	0	no	21984.47061
4	32	male	28.880	0	no	3866.85520

[16]:
```
data=pd.get_dummies(data,drop_first=True)
```

[18]:
```
data
```

[18]:

	age	bmi	children	charges	sex_male	smoker_yes
0	19	27.900	0	16884.92400	False	True
1	18	33.770	1	1725.55230	True	False
2	28	33.000	3	4449.46200	True	False
3	33	22.705	0	21984.47061	True	False
4	32	28.880	0	3866.85520	True	False

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Python 3 (ipykernel)

[16]:
```
data=pd.get_dummies(data,drop_first=True)
```

[18]:
```
data
```

[18]:

	age	bmi	children	charges	sex_male	smoker_yes
0	19	27.900	0	16884.92400	False	True
1	18	33.770	1	1725.55230	True	False
2	28	33.000	3	4449.46200	True	False
3	33	22.705	0	21984.47061	True	False
4	32	28.880	0	3866.85520	True	False
...	...	...	...	...	...	...
1333	50	30.970	3	10600.54830	True	False
1334	18	31.920	0	2205.98080	False	False
1335	18	36.850	0	1629.83350	False	False
1336	21	25.800	0	2007.94500	False	False
1337	61	29.070	0	29141.36030	False	True

1338 rows × 6 columns

[49]:
```
data["sex_male"]=data["sex_male"].replace({True:1,False:0})
```

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Markdown JupyterLab Python 3 (ipykernel)

[49]:
```
data["sex_male"]=data["sex_male"].replace({True:1,False:0})
```

```
C:\Users\admin\AppData\Local\Temp\ipykernel_9512\671937037.py:1: FutureWarning: Downcasting behavior in `replace` is deprecated and will be removed in a future version. To retain the old behavior, explicitly call `result.infer_objects(copy=False)`. To opt-in to the future behavior, set `pd.set_option('future.no_silent_downcasting', True)`
  data["sex_male"]=data["sex_male"].replace({True:1,False:0})
```

[51]:
```
data
```

[51]:

	age	bmi	children	charges	sex_male	smoker_yes
0	19	27.900	0	16884.92400	0	True
1	18	33.770	1	1725.55230	1	False
2	28	33.000	3	4449.46200	1	False
3	33	22.705	0	21984.47061	1	False
4	32	28.880	0	3866.85520	1	False
...	...	...	...	...	...	...
1333	50	30.970	3	10600.54830	1	False
1334	18	31.920	0	2205.98080	0	False
1335	18	36.850	0	1629.83350	0	False
1336	21	25.800	0	2007.94500	0	False
1337	61	29.070	0	29141.36030	0	True

1338 rows × 6 columns

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Markdown JupyterLab Python 3 (ipykernel)

1338 rows × 6 columns

[53]:
```
data["smoker_yes"]=data["smoker_yes"].replace({True:1,False:0})
```

```
C:\Users\admin\AppData\Local\Temp\ipykernel_9512\910181724.py:1: FutureWarning: Downcasting behavior in `replace` is deprecated and will be removed in a future version. To retain the old behavior, explicitly call `result.infer_objects(copy=False)`. To opt-in to the future behavior, set `pd.set_option('future.no_silent_downcasting', True)`
  data["smoker_yes"]=data["smoker_yes"].replace({True:1,False:0})
```

[55]:
```
data
```

[55]:

	age	bmi	children	charges	sex_male	smoker_yes
0	19	27.900	0	16884.92400	0	1
1	18	33.770	1	1725.55230	1	0
2	28	33.000	3	4449.46200	1	0
3	33	22.705	0	21984.47061	1	0
4	32	28.880	0	3866.85520	1	0
...	...	...	...	...	...	...
1333	50	30.970	3	10600.54830	1	0
1334	18	31.920	0	2205.98080	0	0
1335	18	36.850	0	1629.83350	0	0
1336	21	25.800	0	2007.94500	0	0

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Python 3 (ipykernel)

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[61]:
```
independent=data[["age","bmi","children","sex_male","smoker_yes"]]
dependent=data[["charges"]]
```

[65]:
```
from sklearn.model_selection import train_test_split
X_train,X_test,Y_train,Y_test=train_test_split(independent,dependent,test_size=1/3,random_state=0)
```

[75]:
```
from sklearn.preprocessing import StandardScaler
sc=StandardScaler()
X_train=sc.fit_transform(X_train)
X_test=sc.transform(X_test)
```

[79]:
```
from sklearn.ensemble import RandomForestRegressor
from sklearn.datasets import make_regression
regressor=RandomForestRegressor(criterion="squared_error",max_features="sqrt",random_state=0)
regressor.fit(X_train,Y_train)
```

```
C:\Users\admin\anaconda3\Lib\site-packages\sklearn\base.py:1473: DataConversionWarning: A column-vector y was passed when a 1d array was expected. Please
change the shape of y to (n_samples,), for example using ravel().
  return fit_method(estimator, *args, **kwargs)
```

[79]:
```
RandomForestRegressor
RandomForestRegressor(max_features='sqrt', random_state=0)
```

[81]:
```
Y_pred=regressor.predict(X_test)
```

[85]:
```
from sklearn.metrics import r2_score
```

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Markdown JupyterLab Python 3 (ipykernel)

```
RandomForestRegressor(max_features='sqrt', random_state=0)
```

[81]:
```
Y_pred=regressor.predict(X_test)
```

[85]:
```
from sklearn.metrics import r2_score
r_score=r2_score(Y_test,Y_pred)
print("r_score=",r_score)
```

```
r_score= 0.8721406908163178
```

[87]:
```
age=int(input("enter the prediction input value:"))
bmi=float(input("enter the prediction input value:"))
children=int(input("enter the prediction input value:"))
sex_male=int(input("enter the prediction input value:"))
smoker_yes=int(input("enter the prediction input value:"))
future_prediction=regressor.predict([[age,bmi,children,sex_male,smoker_yes]])
print("future_prediction={}".format(future_prediction))
```

```
enter the prediction input value: 22
enter the prediction input value: 30.250
enter the prediction input value: 2
enter the prediction input value: 0
enter the prediction input value: 1
future_prediction=[48069.5881321]
```

[ ]:

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