In [1]:
```
import pandas as pd
```

In [2]:
```
dataset=pd.read_csv("insurance_pre.csv")
#dataset = pd.get_dummies(dataset['smoker'])
```

In [3]:
```
dataset
```

Out[3]:

	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
1337	61	female	29.070	0	yes	29141.36030

1338 rows × 6 columns

In [4]:
```
dataset.columns
```

Out[4]:
```
Index(['age', 'sex', 'bmi', 'children', 'smoker', 'charges'], dtype='object')
```

In [5]:
```
dataset = pd.get_dummies(dataset,drop_first=True)
dataset=dataset.astype(int)
```

In [6]:
```
dataset
```

Out[6]:

	age	bmi	children	charges	sex_male	smoker_yes
0	19	27	0	16884	0	1
1	18	33	1	1725	1	0
2	28	33	3	4449	1	0
3	33	22	0	21984	1	0
4	32	28	0	3866	1	0
...	...	...	...	...	...	...
1333	50	30	3	10600	1	0
1334	18	31	0	2205	0	0
1335	18	36	0	1629	0	0
1336	21	25	0	2007	0	0
1337	61	29	0	29141	0	1

1338 rows × 6 columns

In [7]:
```
dataset.columns
```

Out[7]:
```
Index(['age', 'bmi', 'children', 'charges', 'sex_male', 'smoker_yes'], dtype='object')
```

In [8]:
```
independent=dataset[['age', 'bmi', 'children', 'charges', 'sex_male', 'smoker_yes']]
dependent=dataset[['charges']]
```

In [9]:
```
independent
```

Out[9]:

	age	bmi	children	charges	sex_male	smoker_yes
0	19	27	0	16884	0	1
1	18	33	1	1725	1	0
2	28	33	3	4449	1	0
3	33	22	0	21984	1	0
4	32	28	0	3866	1	0
...	...	...	...	...	...	...
1333	50	30	3	10600	1	0
1334	18	31	0	2205	0	0
1335	18	36	0	1629	0	0
1336	21	25	0	2007	0	0
1337	61	29	0	29141	0	1

1338 rows × 6 columns

In [10]:
```
dependent
```

Out[10]:

	charges
0	16884
1	1725
2	4449
3	21984
4	3866
...	...
1333	10600
1334	2205
1335	1629
1336	2007
1337	29141

1338 rows × 1 columns

In [11]:
```
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)
```

In [12]:
```
X_train
```

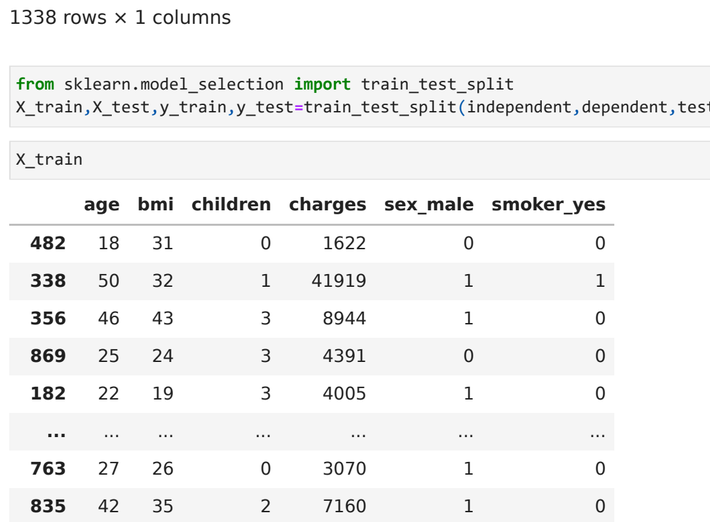
Out[12]:

	age	bmi	children	charges	sex_male	smoker_yes
482	18	31	0	1622	0	0
338	50	32	1	41919	1	1
356	46	43	3	8944	1	0
869	25	24	3	4391	0	0
182	22	19	3	4005	1	0
...	...	...	...	...	...	...
763	27	26	0	3070	1	0
835	42	35	2	7160	1	0
1216	40	25	0	5415	1	0
559	19	35	0	1646	1	0
684	33	18	1	4766	0	0

892 rows × 6 columns

In [13]:
```
from sklearn.tree import DecisionTreeRegressor
regressor=DecisionTreeRegressor(criterion='squared_error',splitter='best',max_features='sqrt')
regressor=regressor.fit(X_train,y_train)
```

In [14]:
```
import matplotlib.pyplot as plt
from sklearn import tree
tree.plot_tree(regressor)
plt.show()
```



In [15]:
```
y_pred=regressor.predict(X_test)
```

In [16]:
```
from sklearn.metrics import r2_score
r_score=r2_score(y_test,y_pred)
```

In [17]:
```
r_score
```

Out[17]:
```
0.9422308789181543
```

In [18]:
```
import pickle
filename="finalized_model_Mul_linear.sav"
pickle.dump(regressor,open(filename,'wb'))
```

In [19]:
```
loaded_model=pickle.load(open("finalized_model_Mul_linear.sav",'rb'))
```

In [ ]:
```

```