In [1]:

```
#importing libraries
import numpy as np
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
import warnings
warnings.filterwarnings("ignore")
```

...

In [2]:

```
#loading the data
df = pd.read_csv("insurance.csv")
```

In [3]:

```
df.head()
```

Out[3]:

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

In [4]:

```
#number of rows and columns
df.shape
```

Out[4]:

```
(1338, 7)
```

In [5]:

```
#getting informaton about data
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1338 entries, 0 to 1337
Data columns (total 7 columns):
 #   Column    Non-Null Count  Dtype  
---  ------    --------------  -----  
 0   age       1338 non-null   int64  
 1   sex       1338 non-null   object 
 2   bmi       1338 non-null   float64
 3   children  1338 non-null   int64  
 4   smoker    1338 non-null   object 
 5   region    1338 non-null   object 
 6   charges   1338 non-null   float64
dtypes: float64(2), int64(2), object(3)
memory usage: 73.3+ KB
```

In [6]:

```
#checking for duplicate values
df.isnull().sum()
```

Out[6]:

```
age         0
sex         0
bmi         0
children    0
smoker      0
region      0
charges     0
dtype: int64
```

In [7]:

```
df['sex'].unique()
```

Out[7]:

```
array(['female', 'male'], dtype=object)
```

In [8]:

```
#checking statistical values
df.describe()
```

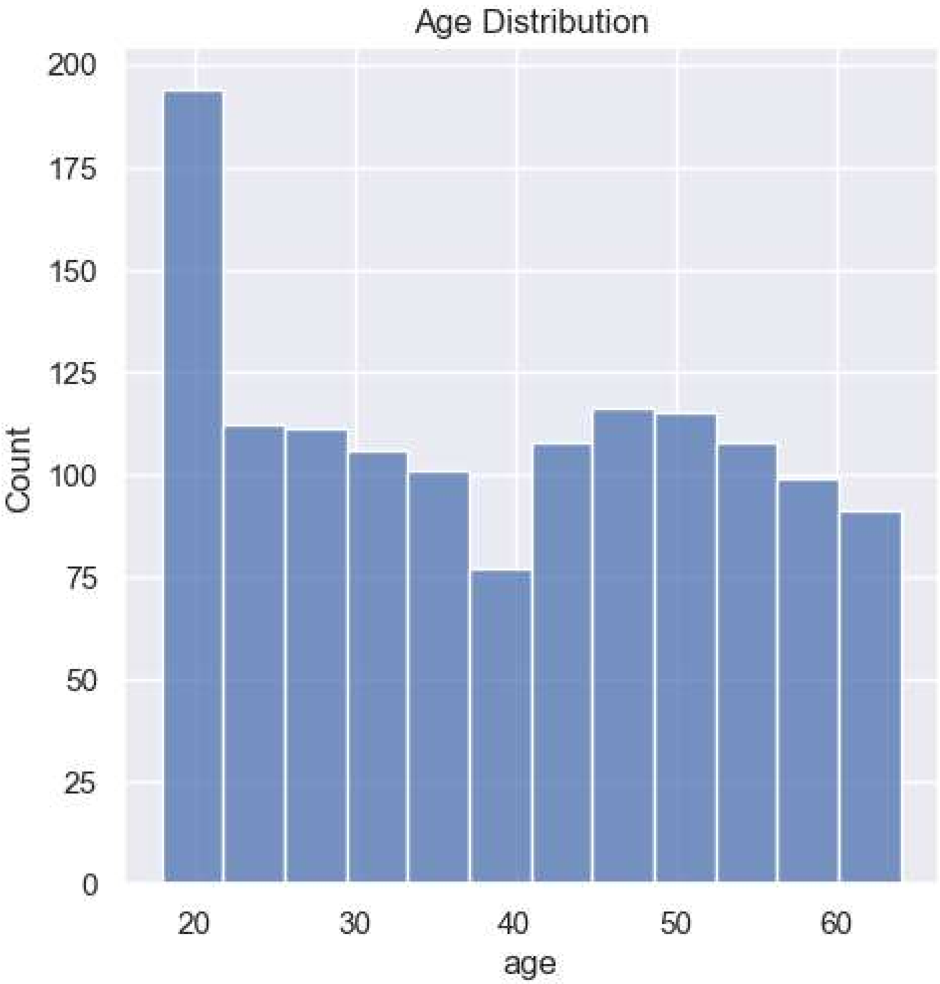
Out[8]:

	age	bmi	children	charges
count	1338.000000	1338.000000	1338.000000	1338.000000
mean	39.207025	30.663397	1.094918	13270.422265
std	14.049960	6.098187	1.205493	12110.011237
min	18.000000	15.960000	0.000000	1121.873900
25%	27.000000	26.296250	0.000000	4740.287150
50%	39.000000	30.400000	1.000000	9382.033000
75%	51.000000	34.693750	2.000000	16639.912515
max	64.000000	53.130000	5.000000	63770.428010

In [9]:

```
#distribution of age
sns.set()
plt.figure(figsize=(6,6))
sns.displot(df["age"])
plt.title("Age Distribution")
plt.show()
```

```
<Figure size 600x600 with 0 Axes>
```

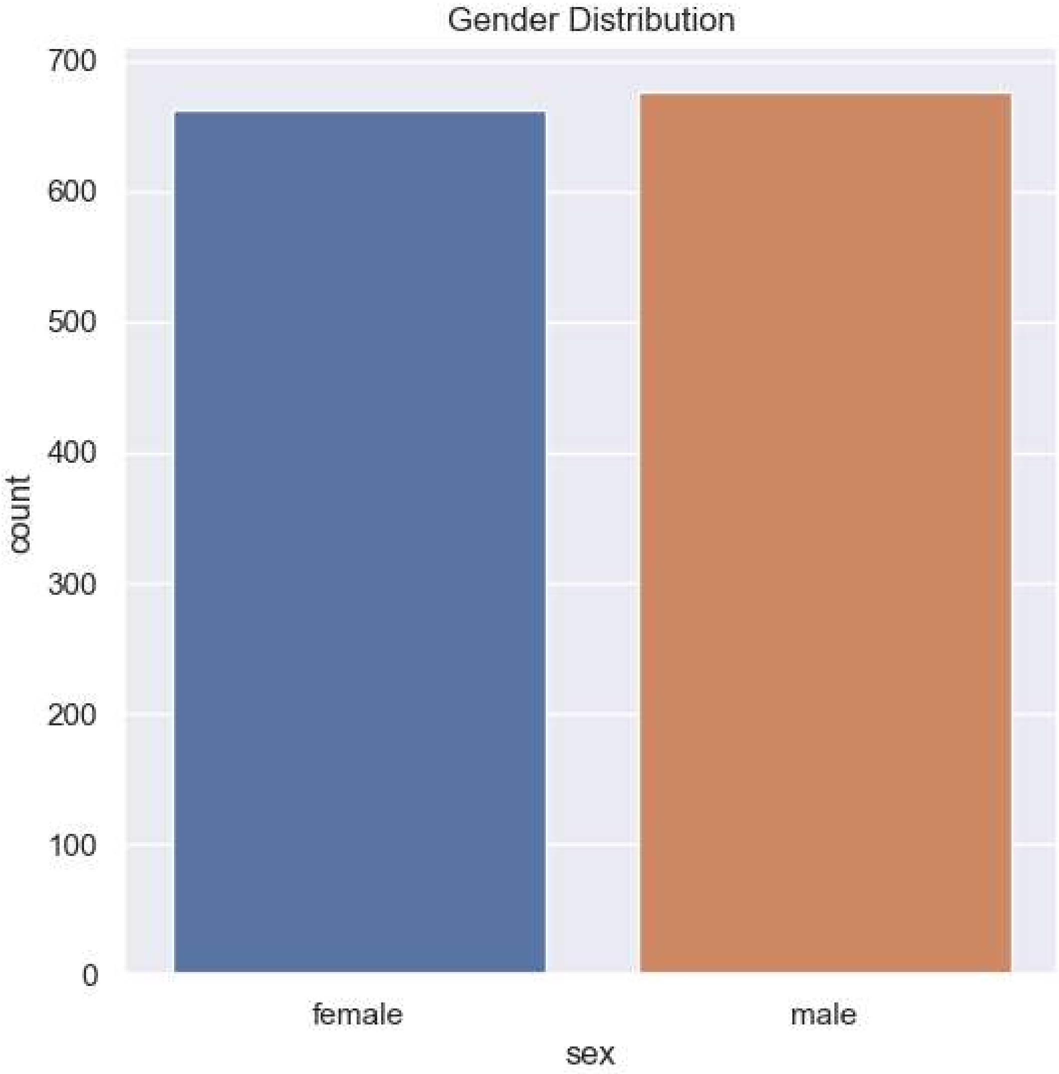


In [10]:

```
#most of the people in age column are of age 20
```

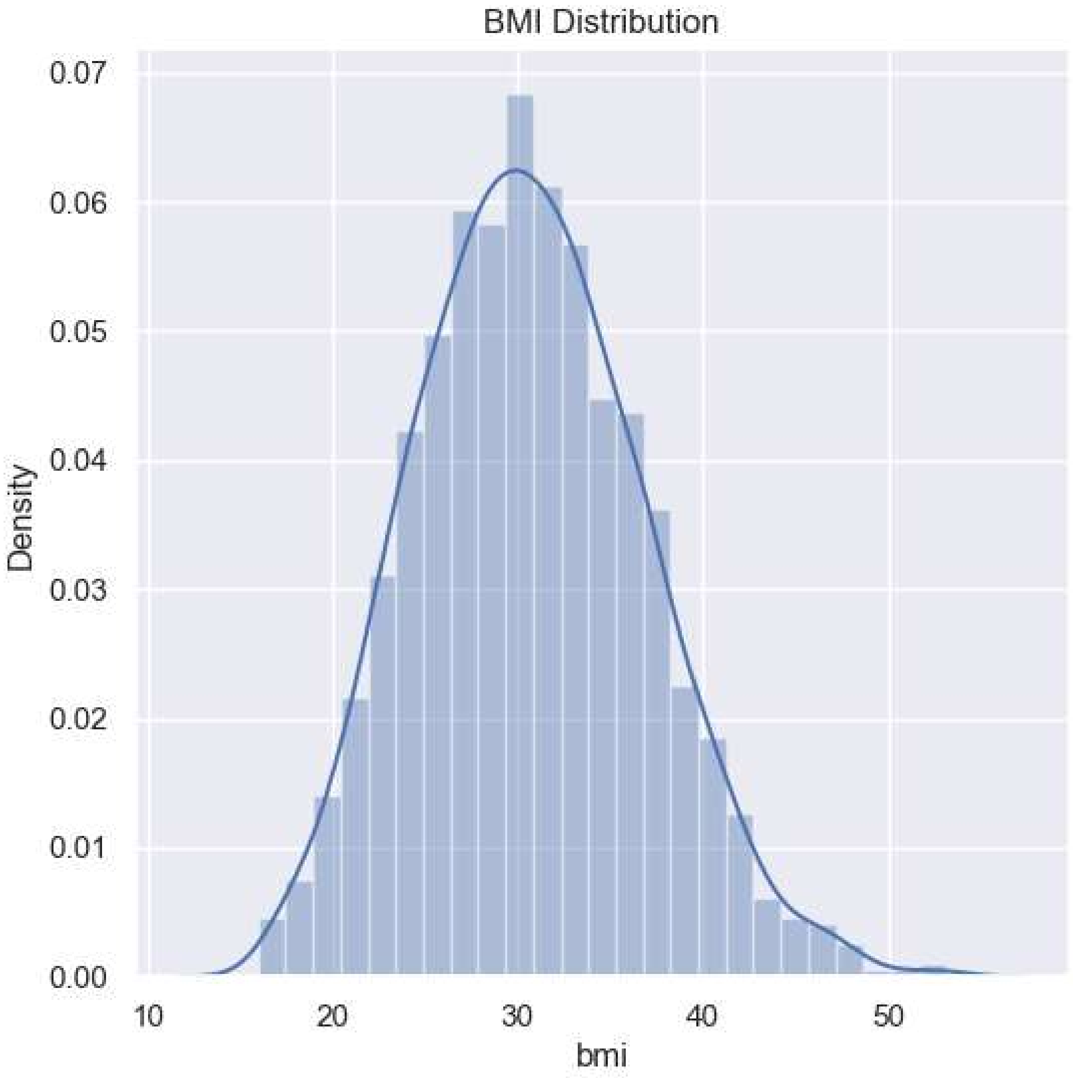
In [11]:

```
#distribution of sex column
plt.figure(figsize=(6,6))
sns.countplot(df["sex"])
plt.title("Gender Distribution")
plt.show()
```

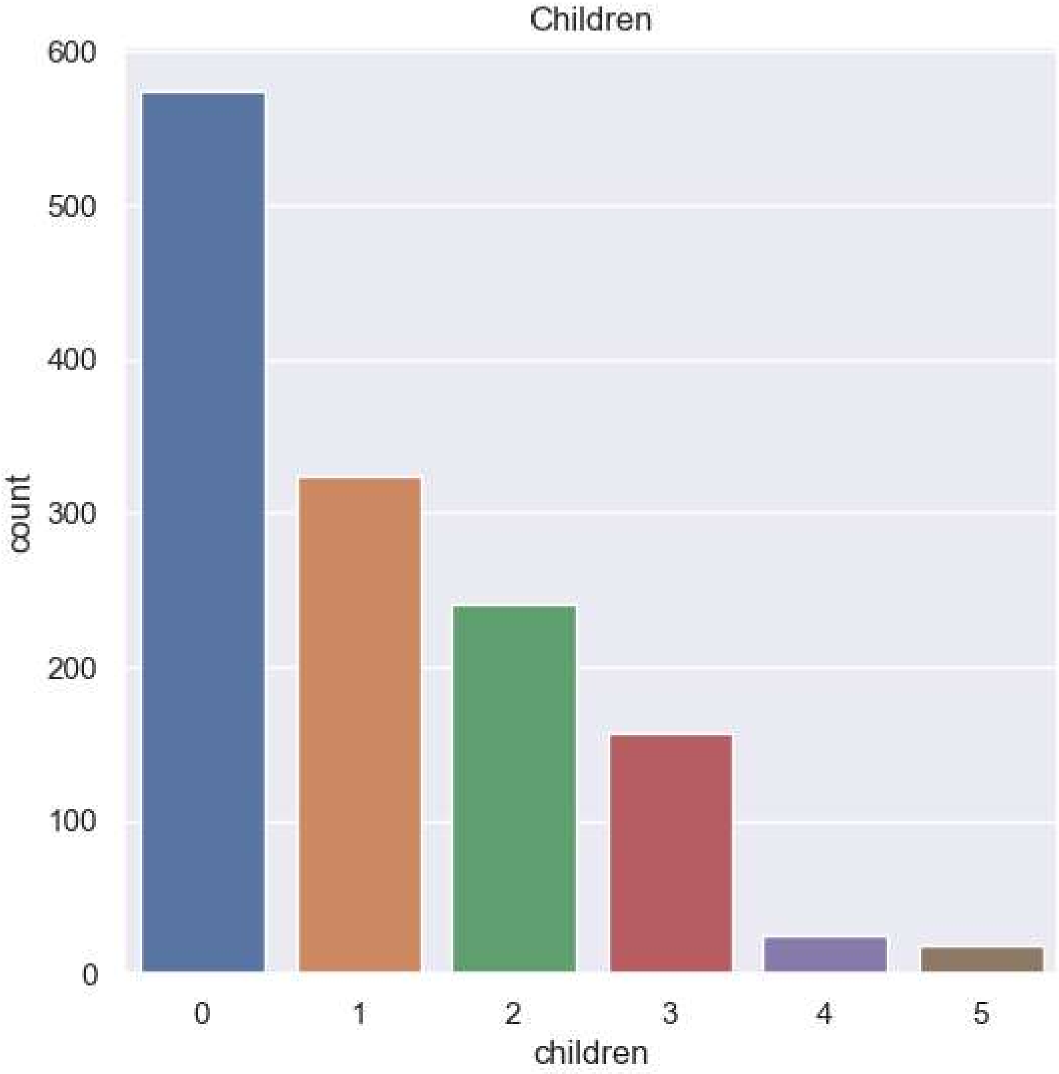


In [12]:

```
#distribution of bmi column
plt.figure(figsize=(6,6))
sns.distplot(df["bmi"])
plt.title("BMI Distribution")
plt.show()
```



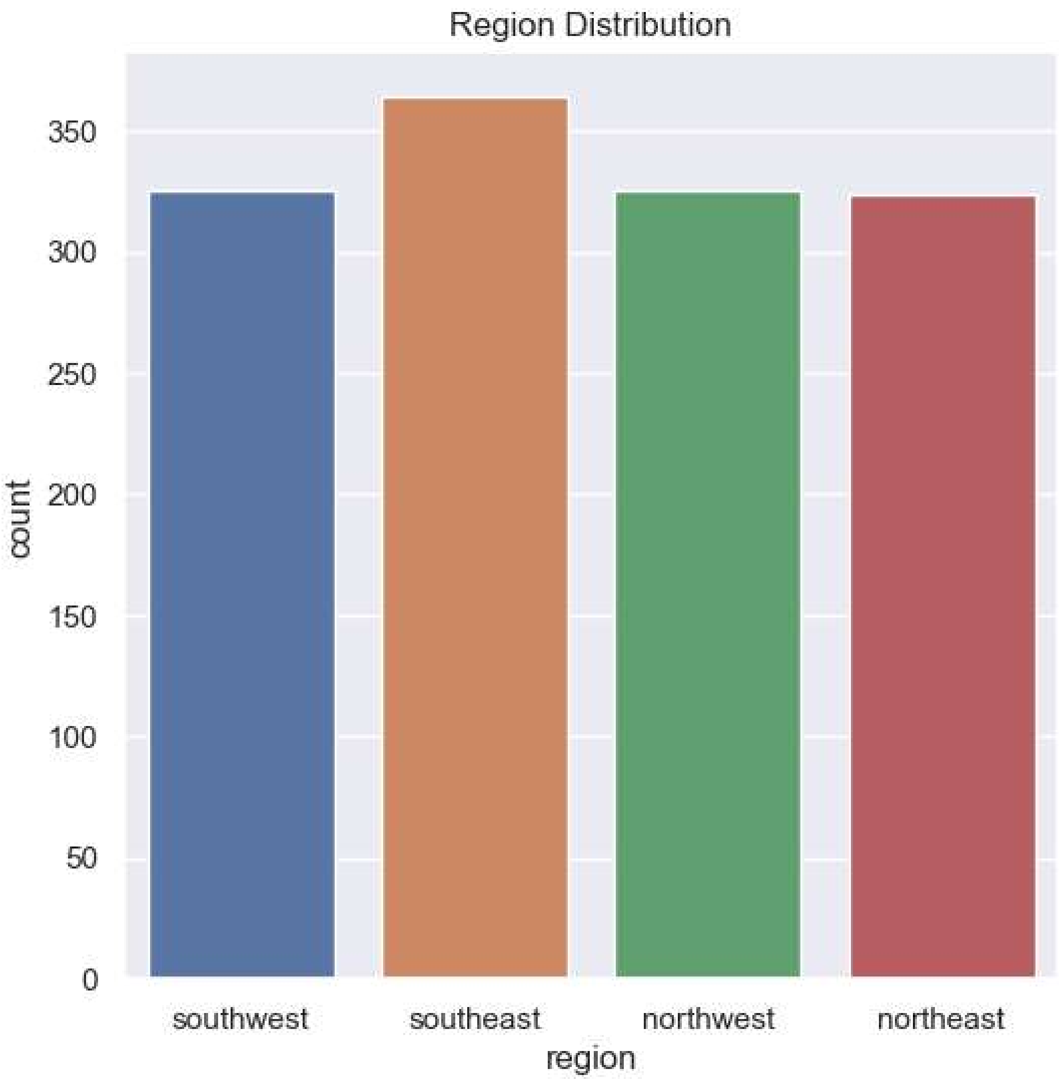
In [13]:
```
#distribution of children column
plt.figure(figsize=(6,6))
sns.countplot(df["children"])
plt.title("Children")
plt.show()
```



In [14]:
```
df["smoker"].value_counts()
```

Out[14]:
```
no      1064
yes      274
Name: smoker, dtype: int64
```

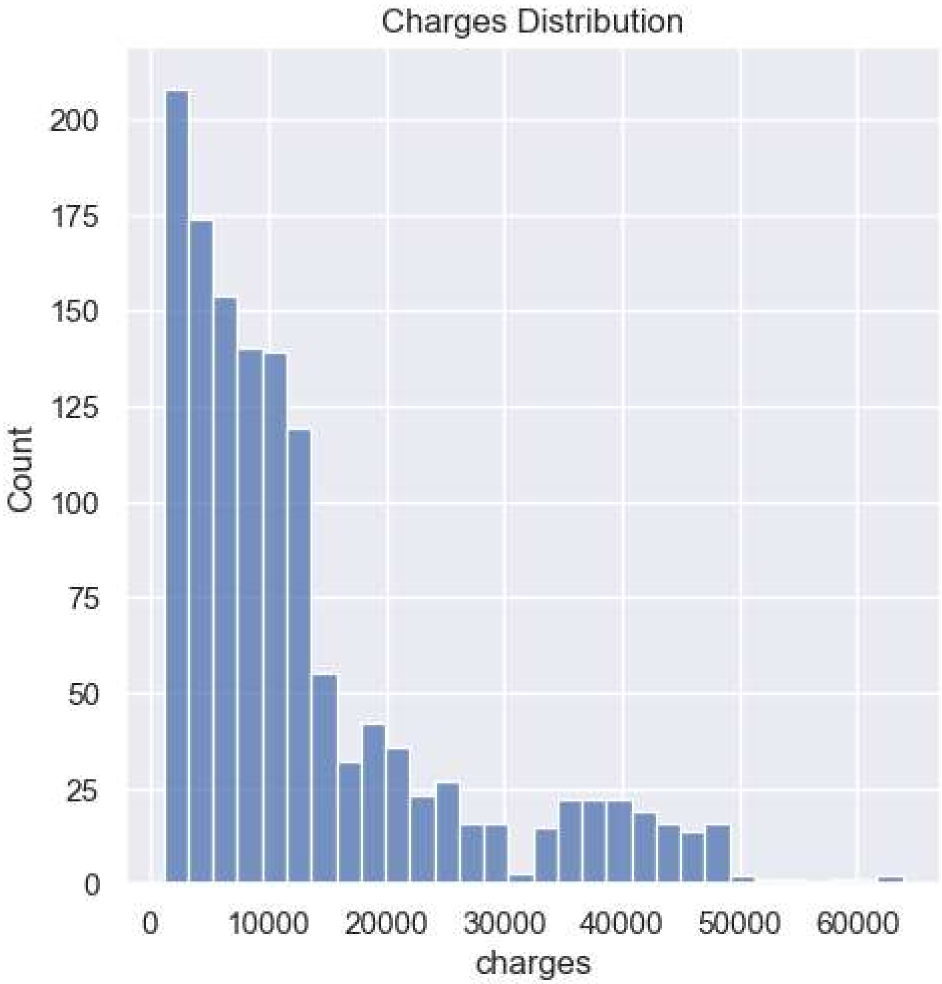
In [15]:
```
#distribution of region column
plt.figure(figsize=(6,6))
sns.countplot(df["region"])
plt.title("Region Distribution")
plt.show()
```



In [16]:

```
#distribution of charges column
plt.figure(figsize=(6,6))
sns.displot(df["charges"])
plt.title("Charges Distribution")
plt.show()
```

```
<Figure size 600x600 with 0 Axes>
```



In [17]:

```
df.head()
```

Out[17]:

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

In [18]:

```
df.replace({'sex':{'male':0,'female':1}}, inplace = True)
df.replace({'smoker':{'yes':0,'no':1}}, inplace = True)
df.replace({'region':{'southeast':0,'southwest':1,'northeast':2,'northwest':3}
```

In [19]:

```
x = df.drop (columns="charges" , axis =1)
y = df['charges']
```

In [20]:

```
x
```

Out[20]:

	age	sex	bmi	children	smoker	region
0	19	1	27.900	0	0	1
1	18	0	33.770	1	1	0
2	28	0	33.000	3	1	0
3	33	0	22.705	0	1	3
4	32	0	28.880	0	1	3
...	...	...	...	...	...	...
1333	50	0	30.970	3	1	3
1334	18	1	31.920	0	1	2
1335	18	1	36.850	0	1	0
1336	21	1	25.800	0	1	1
1337	61	1	29.070	0	0	3

1338 rows × 6 columns

In [21]:

```
y
```

Out[21]:

```
0       16884.92400
1        1725.55230
2        4449.46200
3       21984.47061
4        3866.85520
           ...
1333    10600.54830
1334     2205.98080
1335     1629.83350
1336     2007.94500
1337    29141.36030
Name: charges, Length: 1338, dtype: float64
```

In [39]:

```
#splitting data into training and testing
from sklearn.model_selection import train_test_split
xtrain,xtest,ytrain,ytest = train_test_split(x,y,test_size=0.25,random_state=2
```

In [40]:

```
#importing the Model
from sklearn.linear_model import LinearRegression
linreg = LinearRegression()
linreg.fit(xtrain,ytrain)
ypred = linreg.predict(xtest)
```

In [41]:

```
from sklearn.metrics import r2_score
r2 = r2_score(ytest,ypred)
print(f"ACCURACY IS {r2}")
```

```
ACCURACY IS 0.7866991817223289
```

In [42]:

```
def makeprediction():
    age = int(input("ENTER YOUR AGE :"))
    sex = input("ENTER YOUR GENDER(IF MALE:0,FEMALE:1): ")
    bmi = float(input("ENTER YOUR BMI(BODY MASS INDEX) : "))
    children = int(input("ENTER NUMBER OF CHILDRENS :"))
    smoker  = input("DO YOU SMOKE(IF YES:0 or NO:1) :")
    region = input("ENTER YOUR REGION(IF SOUTHEAST:0,SOUTHWEST:1,NORTHEAST:2,N
    newob=[[age,sex,bmi,children,smoker,region]]
    input_as_numpyarray = np.asarray(newob)
    input_datareshaped = input_as_numpyarray . reshape(1,-1)


    yp = linreg.predict(newob)
    yp = int(yp)

    print(f"COST OF YOUR MEDICAL INSURSNCE IS $ {yp}")
```

In [43]:

```
makeprediction()
```

```
ENTER YOUR AGE :19
ENTER YOUR GENDER(IF MALE:0,FEMALE:1): 1
ENTER YOUR BMI(BODY MASS INDEX) : 27.9
ENTER NUMBER OF CHILDRENS :0
DO YOU SMOKE(IF YES:0 or NO:1) :0
ENTER YOUR REGION(IF SOUTHEAST:0,SOUTHWEST:1,NORTHEAST:2,NORTHWEST:3): 1
COST OF YOUR MEDICAL INSURSNCE IS $ 25206
```

In [ ]: