```python
In [7]:  import numpy as np
         import pandas as pd
         import matplotlib.pyplot as plt
```

```python
In [8]:  a=pd.read_csv('headbrain1.csv')
         a
```

Out[8]:

	Gender	Age Range	Head Size	Brain Weight
0	1	1	4512	1530
1	1	1	3738	1297
2	1	1	4261	1335
3	1	1	3777	1282
4	1	1	4177	1590
...	...	...	...	...
232	2	2	3214	1110
233	2	2	3394	1215
234	2	2	3233	1104
235	2	2	3352	1170
236	2	2	3391	1120

237 rows × 4 columns

```python
In [9]:  a.head()
```

Out[9]:

	Gender	Age Range	Head Size	Brain Weight
0	1	1	4512	1530
1	1	1	3738	1297
2	1	1	4261	1335
3	1	1	3777	1282
4	1	1	4177	1590

```python
In [10]:  a.tail()
```

Out[10]:

	Gender	Age Range	Head Size	Brain Weight
232	2	2	3214	1110
233	2	2	3394	1215
234	2	2	3233	1104
235	2	2	3352	1170
236	2	2	3391	1120

In [11]:
```python
a.shape
```

Out[11]: (237, 4)

In [12]:
```python
a.size
```

Out[12]: 948

In [13]:
```python
X=a['Head Size']
X
```

Out[13]:
```
0      4512
1      3738
2      4261
3      3777
4      4177
       ...
232    3214
233    3394
234    3233
235    3352
236    3391
Name: Head Size, Length: 237, dtype: int64
```

In [14]:
```python
Y=a['Brain Weight']
Y
```

Out[14]:
```
0      1530
1      1297
2      1335
3      1282
4      1590
       ...
232    1110
233    1215
234    1104
235    1170
236    1120
Name: Brain Weight, Length: 237, dtype: int64
```

In [15]:
```python
n=len(X)
```

```
n
```

Out[15]: 237

In [16]:
```python
sum_x=np.sum(X)
sum_y=np.sum(Y)
sum_xy=np.sum(X*Y)
sum_xx=np.sum(X*X)
```

In [18]:
```python
m=((n*sum_xy)-(sum_x*sum_y))/(n*sum_xx-sum_x**2)
c=(sum_y-m*sum_x)/n
```

In [19]:
```python
print(m)
```

0.2634293394893993

In [20]:
```python
print(c)
```

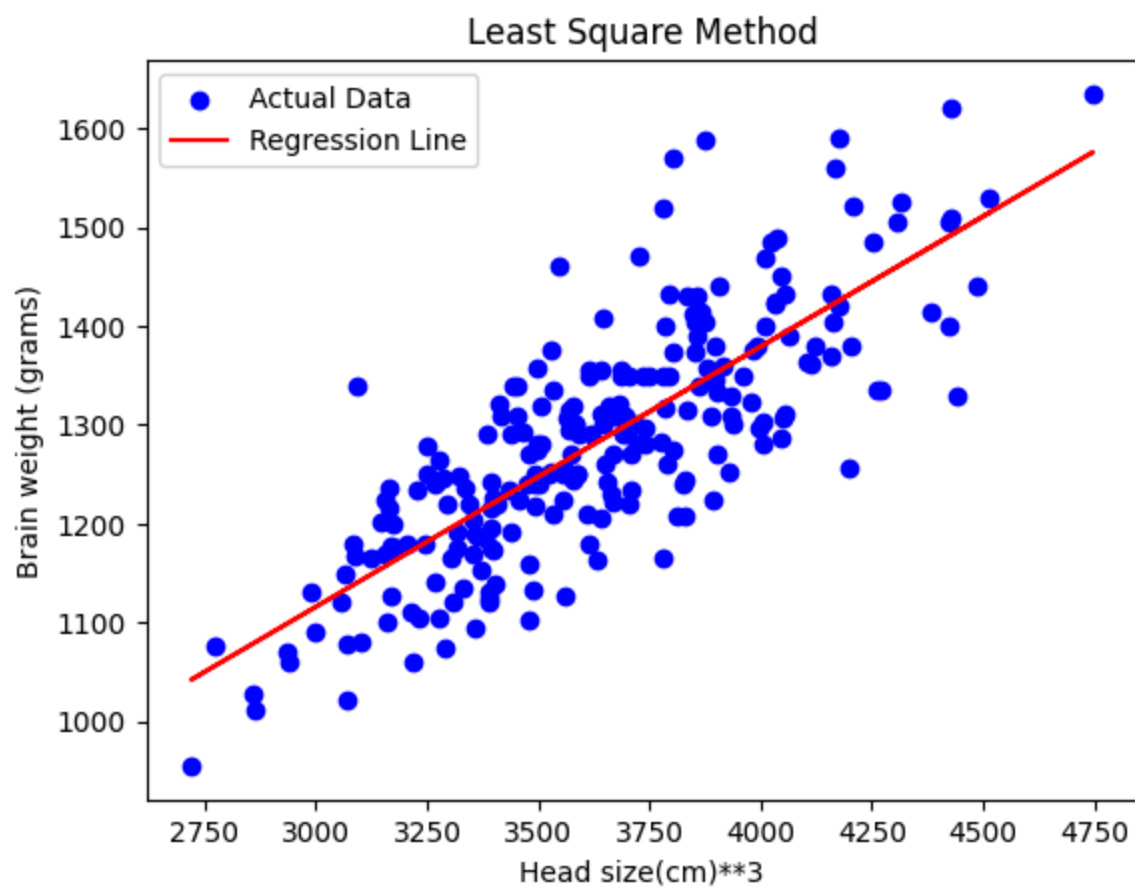325.57342104944274

In [21]:
```python
Y_pred=m*X+c
Y_pred
```

Out[21]:
```
0      1514.166601
1      1310.272292
2      1448.045837
3      1320.546036
4      1425.917772
          ...
232    1172.235318
233    1219.652599
234    1177.240476
235    1208.588567
236    1218.862311
Name: Head Size, Length: 237, dtype: float64
```

In [23]:
```python
r1=np.sum((Y-Y_pred)**2)
r2=np.sum((Y-np.mean(Y))**2)
rs=1-(r1/r2)
rs
```

Out[23]: np.float64(0.6393117199570002)

In [22]:
```python
plt.scatter(X,Y,color='blue',label='Actual Data')
plt.plot(X,Y_pred,color='red',label='Regression Line')
plt.xlabel('Head size(cm)**3')
plt.ylabel('Brain weight (grams)'
          )
plt.title('Least Square Method')
plt.legend()
plt.show()
```

Least Square Method

In [ ]: