

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
```

```
from google.colab import drive
drive.mount('/content/drive')
```

Mounted at /content/drive

```
file_path='/content/drive/My Drive/machine learning/headbrain.csv'
df=pd.read_csv(file_path)
print(df.head())
```

	Gender	Age Range	Head Size(cm^3)	Brain Weight(grams)
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

```
head=np.array(df['Head Size(cm^3)'],dtype=float)
brain=np.array(df['Brain Weight(grams)'],dtype=float)
n=len(head)
```

```
sum_head = np.sum(head)
sum_brain = np.sum(brain)
sum_head_brain = np.sum(head * brain)
sum_head_square = np.sum(head * head)
```

```
n = len(head)
mean_x = sum_head / n
mean_y = sum_brain / n
mean_xy = sum_head_brain / n
mean_x2 = sum_head_square / n
```

```
w1 = (mean_xy - mean_x * mean_y) / (mean_x2 - (mean_x ** 2))
w0 = mean_y - w1 * mean_x
print(w1)
print(w0)
```

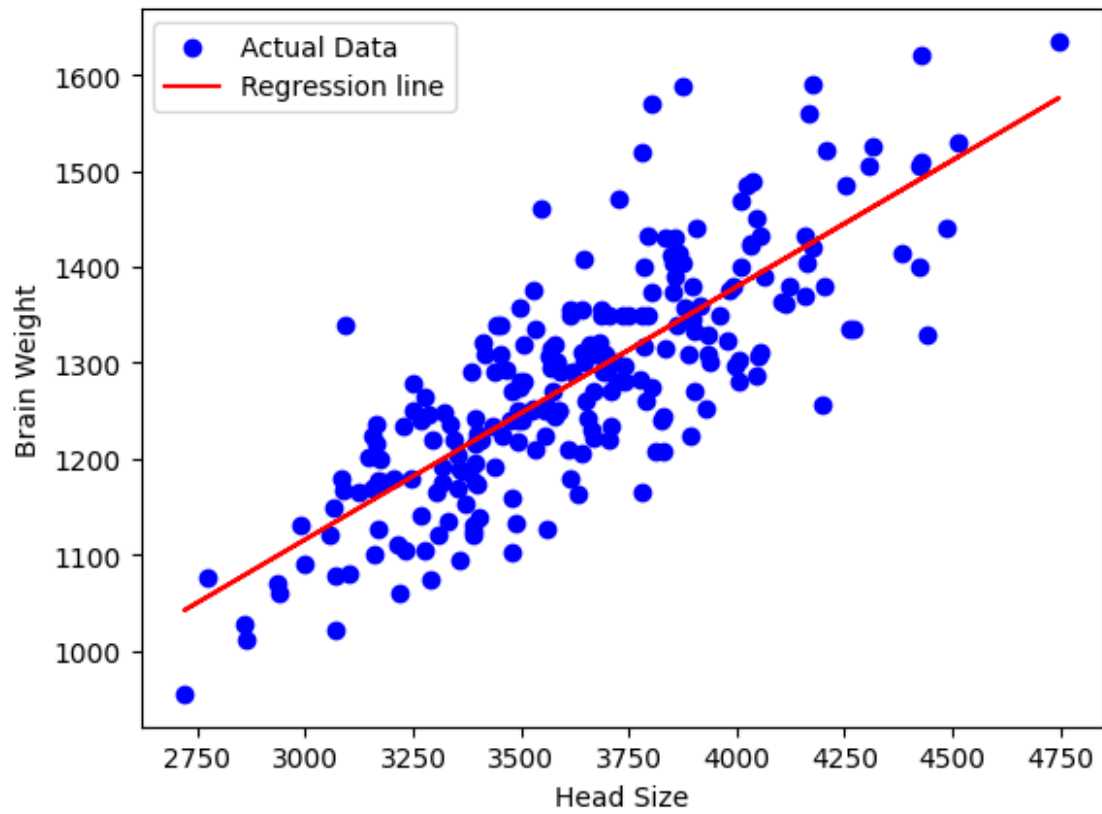
```
0.2634293394893941
325.57342104946156
```

```
y=w0+w1*head
print(y)
```

```
[1514.16660083 1310.27229206 1448.04583661 1320.5460363 1425.9177721
1269.96760312 1322.65347102 1263.11844029 1277.34362462 1374.5490509
1232.56063691 1377.44677363 1284.45621679 1434.08408162 1335.03464997
1346.62554091 1246.78582124 1238.61951172 1140.88722677 1490.98481895
1347.15239959 1391.40852862 1327.65862847 1302.89627056 1576.07249561
1490.72138961 1388.77423523 1385.08622448 1235.45835965 1425.39091342]
```

1323.1803297	1325.55119375	1406.42400097	1421.70290266	1420.91261465
1330.29292186	1254.68870143	1312.90658546	1203.84683891	1245.46867455
1369.28046411	1248.89325596	1462.27102095	1327.65862847	1343.2009595
1388.24737655	1460.42701557	1159.32728053	1284.71964613	1285.50993415
1350.576981	1324.76090573	1450.41670067	1395.88682739	1382.45193108
1236.512077	1350.31355166	1423.02004936	1362.16787194	1292.09566764
1343.99124752	1219.38916994	1495.72654706	1445.9384019	1307.37456933
1202.52969221	1225.18461541	1213.85715381	1492.56539499	1479.65735735
1381.39821372	1341.8838128	1411.16572909	1394.30625136	1332.92721526
1219.65259928	1262.85501095	1211.22286041	1360.85072524	1335.82493799
1334.50779129	1341.35695412	1181.45534505	1267.8601684	1361.64101326
1339.77637808	1197.26110542	1222.81375135	1249.1566853	1354.79185043
1421.43947333	1199.63196948	1290.25166226	1352.68441572	1300.26197716
1321.07289498	1240.4635171	1244.94181587	1288.14422754	1241.78066379
1246.25896256	1335.56150865	1346.62554091	1289.98823292	1278.66077132
1286.56365151	1387.72051787	1220.96974597	1357.16271449	1492.56539499
1298.94483046	1253.89841341	1266.27959237	1272.33846717	1216.75487654
1247.31267992	1271.02132048	1352.94784506	1409.32172371	1362.69473062
1220.96974597	1431.9766469	1507.84429668	1277.60705396	1392.72567532
1321.863183	1218.86231126	1148.52667761	1393.252534	1269.1773151
1291.30537962	1256.00584813	1391.40852862	1291.56880896	1078.19104397
1230.71663154	1324.23404705	1195.41710004	1143.25809082	1160.90785657
1266.54302171	1255.47898945	1161.96157393	1231.24349021	1353.73813308
1352.68441572	1221.49660465	1186.19707316	1234.66807163	1139.57008007
1224.65775673	1200.94911617	1294.99339037	1231.50691955	1340.5666661
1156.95641648	1189.35822524	1302.10598254	1380.87135504	1186.72393184
1134.56492262	1321.07289498	1260.22071756	1192.78280665	1246.78582124
1137.46264536	1181.19191571	1210.16914305	1327.39519913	1264.96244567
1154.05869374	1248.36639728	1266.27959237	1306.58428131	1277.8704833
1169.33759543	1276.28990727	1263.64529897	1373.75876288	1256.26927747
1297.36425443	1157.48327516	1380.6079257	1163.54214997	1242.04409313
1284.98307547	1282.34878207	1134.03806394	1219.65259928	1301.05226518
1159.32728053	1209.1154257	1115.86143952	1296.83739575	1262.32815227
1056.06297945	1131.14034121	1206.4811323	1245.73210389	1194.09995335
1210.69600173	1175.92332892	1188.83136656	1340.03980742	1133.51120526
1298.15454244	1221.76003399	1377.97363231	1199.63196948	1042.10122446
1099.26539113	1268.65045642	1099.79224981	1112.96371678	1270.23103246
1156.95641648	1180.66505703	1160.64442723	1186.4605025	1218.33545258
1216.22801786	1080.03504935	1310.79915074	1242.04409313	1286.30022217
1304.47684659	1190.67537193	1433.03036426	1309.48200404	1173.28903553
1296.31053707	1301.31569452	1172.23531817	1219.65259928	1177.24047562
1208.58856702	1218.86231126]			

```
plt.scatter(head,brain,color='blue',label='Actual Data')
plt.plot(head,y,color='red',label='Regression line')
plt.xlabel('Head Size')
plt.ylabel('Brain Weight')
plt.legend()
plt.show()
```



```
meansquare=np.mean((brain-y)**2)
print(meansquare)
5201.384028002329
```