In [1]:

```python
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
%matplotlib inline
import math
```

In [3]:

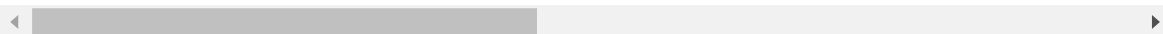```python
cc=pd.read_csv('creditcard_csv.csv')
cc.head(1)
```

Out[3]:

| | Time | V1 | V2 | V3 | V4 | V5 | V6 | V7 | V8 |
|---|---|---|---|---|---|---|---|---|---|
| **0** | 0.0 | -1.359807 | -0.072781 | 2.536347 | 1.378155 | -0.338321 | 0.462388 | 0.239599 | 0.098698 |

1 rows × 31 columns

In [4]:

```python
cc.head(10)
```

Out[4]:

	Time	V1	V2	V3	V4	V5	V6	V7	V
0	0.0	-1.359807	-0.072781	2.536347	1.378155	-0.338321	0.462388	0.239599	0.09869
1	0.0	1.191857	0.266151	0.166480	0.448154	0.060018	-0.082361	-0.078803	0.08510
2	1.0	-1.358354	-1.340163	1.773209	0.379780	-0.503198	1.800499	0.791461	0.24767
3	1.0	-0.966272	-0.185226	1.792993	-0.863291	-0.010309	1.247203	0.237609	0.37743
4	2.0	-1.158233	0.877737	1.548718	0.403034	-0.407193	0.095921	0.592941	-0.27053
5	2.0	-0.425966	0.960523	1.141109	-0.168252	0.420987	-0.029728	0.476201	0.26031
6	4.0	1.229658	0.141004	0.045371	1.202613	0.191881	0.272708	-0.005159	0.08121
7	7.0	-0.644269	1.417964	1.074380	-0.492199	0.948934	0.428118	1.120631	-3.80786
8	7.0	-0.894286	0.286157	-0.113192	-0.271526	2.669599	3.721818	0.370145	0.85108
9	9.0	-0.338262	1.119593	1.044367	-0.222187	0.499361	-0.246761	0.651583	0.06953

10 rows × 31 columns
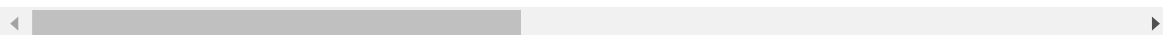
In [5]:

```
cc.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 284807 entries, 0 to 284806
Data columns (total 31 columns):
Time      284807 non-null float64
V1        284807 non-null float64
V2        284807 non-null float64
V3        284807 non-null float64
V4        284807 non-null float64
V5        284807 non-null float64
V6        284807 non-null float64
V7        284807 non-null float64
V8        284807 non-null float64
V9        284807 non-null float64
V10       284807 non-null float64
V11       284807 non-null float64
V12       284807 non-null float64
V13       284807 non-null float64
V14       284807 non-null float64
V15       284807 non-null float64
V16       284807 non-null float64
V17       284807 non-null float64
V18       284807 non-null float64
V19       284807 non-null float64
V20       284807 non-null float64
V21       284807 non-null float64
V22       284807 non-null float64
V23       284807 non-null float64
V24       284807 non-null float64
V25       284807 non-null float64
V26       284807 non-null float64
V27       284807 non-null float64
V28       284807 non-null float64
Amount    284807 non-null float64
Class     284807 non-null object
dtypes: float64(30), object(1)
memory usage: 67.4+ MB
```

In [6]:

```
cc.describe()
```

Out[6]:

	Time	V1	V2	V3	V4	
count	284807.000000	2.848070e+05	2.848070e+05	2.848070e+05	2.848070e+05	2.848070ε
mean	94813.859575	3.919560e-15	5.688174e-16	-8.769071e-15	2.782312e-15	-1.552563
std	47488.145955	1.958696e+00	1.651309e+00	1.516255e+00	1.415869e+00	1.380247ε
min	0.000000	-5.640751e+01	-7.271573e+01	-4.832559e+01	-5.683171e+00	-1.137433ε
25%	54201.500000	-9.203734e-01	-5.985499e-01	-8.903648e-01	-8.486401e-01	-6.915971
50%	84692.000000	1.810880e-02	6.548556e-02	1.798463e-01	-1.984653e-02	-5.433583
75%	139320.500000	1.315642e+00	8.037239e-01	1.027196e+00	7.433413e-01	6.119264
max	172792.000000	2.454930e+00	2.205773e+01	9.382558e+00	1.687534e+01	3.480167ε

8 rows × 30 columns
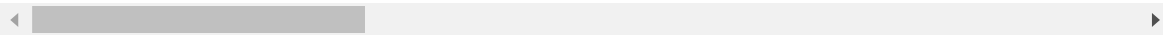
In [7]:

```
cc.isnull()
```

Out[7]:

	Time	V1	V2	V3	V4	V5	V6	V7	V8	V9	...	V21	V22
0	False	False	False	False	False	False	False	False	False	False	...	False	False
1	False	False	False	False	False	False	False	False	False	False	...	False	False
2	False	False	False	False	False	False	False	False	False	False	...	False	False
3	False	False	False	False	False	False	False	False	False	False	...	False	False
4	False	False	False	False	False	False	False	False	False	False	...	False	False
5	False	False	False	False	False	False	False	False	False	False	...	False	False
6	False	False	False	False	False	False	False	False	False	False	...	False	False
7	False	False	False	False	False	False	False	False	False	False	...	False	False
8	False	False	False	False	False	False	False	False	False	False	...	False	False
9	False	False	False	False	False	False	False	False	False	False	...	False	False
10	False	False	False	False	False	False	False	False	False	False	...	False	False
11	False	False	False	False	False	False	False	False	False	False	...	False	False
12	False	False	False	False	False	False	False	False	False	False	...	False	False
13	False	False	False	False	False	False	False	False	False	False	...	False	False
14	False	False	False	False	False	False	False	False	False	False	...	False	False
15	False	False	False	False	False	False	False	False	False	False	...	False	False
16	False	False	False	False	False	False	False	False	False	False	...	False	False
17	False	False	False	False	False	False	False	False	False	False	...	False	False
18	False	False	False	False	False	False	False	False	False	False	...	False	False
19	False	False	False	False	False	False	False	False	False	False	...	False	False
20	False	False	False	False	False	False	False	False	False	False	...	False	False
21	False	False	False	False	False	False	False	False	False	False	...	False	False
22	False	False	False	False	False	False	False	False	False	False	...	False	False
23	False	False	False	False	False	False	False	False	False	False	...	False	False
24	False	False	False	False	False	False	False	False	False	False	...	False	False
25	False	False	False	False	False	False	False	False	False	False	...	False	False
26	False	False	False	False	False	False	False	False	False	False	...	False	False
27	False	False	False	False	False	False	False	False	False	False	...	False	False
28	False	False	False	False	False	False	False	False	False	False	...	False	False
29	False	False	False	False	False	False	False	False	False	False	...	False	False
...	...	...	...	...	...	...	...	...	...	...	...	...	...
284777	False	False	False	False	False	False	False	False	False	False	...	False	False
284778	False	False	False	False	False	False	False	False	False	False	...	False	False
284779	False	False	False	False	False	False	False	False	False	False	...	False	False
284780	False	False	False	False	False	False	False	False	False	False	...	False	False
284781	False	False	False	False	False	False	False	False	False	False	...	False	False
284782	False	False	False	False	False	False	False	False	False	False	...	False	False

	Time	V1	V2	V3	V4	V5	V6	V7	V8	V9	...	V21	V22
284783	False	False	False	False	False	False	False	False	False	False	...	False	False
284784	False	False	False	False	False	False	False	False	False	False	...	False	False
284785	False	False	False	False	False	False	False	False	False	False	...	False	False
284786	False	False	False	False	False	False	False	False	False	False	...	False	False
284787	False	False	False	False	False	False	False	False	False	False	...	False	False
284788	False	False	False	False	False	False	False	False	False	False	...	False	False
284789	False	False	False	False	False	False	False	False	False	False	...	False	False
284790	False	False	False	False	False	False	False	False	False	False	...	False	False
284791	False	False	False	False	False	False	False	False	False	False	...	False	False
284792	False	False	False	False	False	False	False	False	False	False	...	False	False
284793	False	False	False	False	False	False	False	False	False	False	...	False	False
284794	False	False	False	False	False	False	False	False	False	False	...	False	False
284795	False	False	False	False	False	False	False	False	False	False	...	False	False
284796	False	False	False	False	False	False	False	False	False	False	...	False	False
284797	False	False	False	False	False	False	False	False	False	False	...	False	False
284798	False	False	False	False	False	False	False	False	False	False	...	False	False
284799	False	False	False	False	False	False	False	False	False	False	...	False	False
284800	False	False	False	False	False	False	False	False	False	False	...	False	False
284801	False	False	False	False	False	False	False	False	False	False	...	False	False
284802	False	False	False	False	False	False	False	False	False	False	...	False	False
284803	False	False	False	False	False	False	False	False	False	False	...	False	False
284804	False	False	False	False	False	False	False	False	False	False	...	False	False
284805	False	False	False	False	False	False	False	False	False	False	...	False	False
284806	False	False	False	False	False	False	False	False	False	False	...	False	False

284807 rows × 31 columns

In [8]:

```python
sns.countplot(x='Class', data=cc);
```
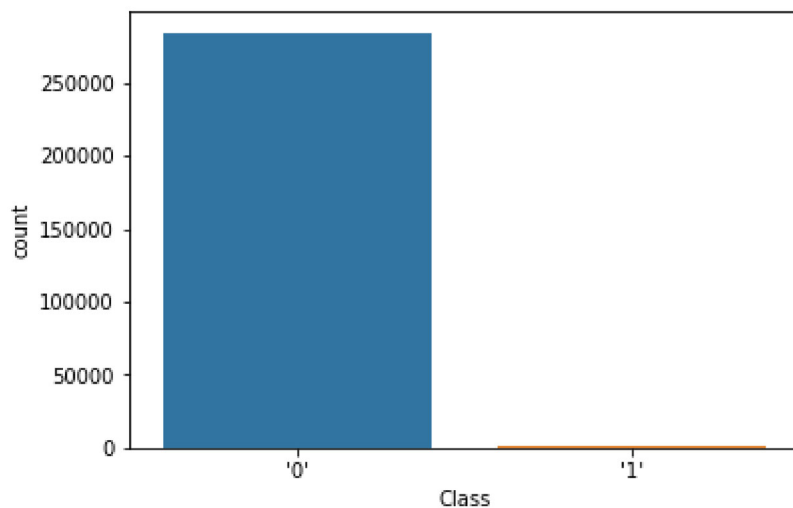

In [10]:

```python
X=cc.drop('Class', axis=1)
y=cc['Class']
```

In [12]:

```python
from sklearn.model_selection import train_test_split
```

In [13]:

```python
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2)
```

In [14]:

```python
from sklearn.linear_model import LogisticRegression
```

In [15]:

```python
logmodel=LogisticRegression()
```

In [17]:

```python
logmodel.fit(X_train, y_train)
```

```
C:\Users\Ashish\Anaconda3\lib\site-packages\sklearn\linear_model\logistic.
py:433: FutureWarning: Default solver will be changed to 'lbfgs' in 0.22.
Specify a solver to silence this warning.
  FutureWarning)
```

Out[17]:

```
LogisticRegression(C=1.0, class_weight=None, dual=False, fit_intercept=Tru
e,
          intercept_scaling=1, max_iter=100, multi_class='warn',
          n_jobs=None, penalty='l2', random_state=None, solver='warn',
          tol=0.0001, verbose=0, warm_start=False)
```

In [18]:

```python
predictions=logmodel.predict(X_test)
```

In [19]:

```python
from sklearn.metrics import classification_report
```

In [20]:

```python
from sklearn.metrics import confusion_matrix
```

In [21]:

```python
confusion_matrix(y_test, predictions)
```

Out[21]:

```
array([[56841,    25],
       [   36,    60]], dtype=int64)
```

In [23]:

```python
from sklearn.metrics import accuracy_score
```

In [24]:

```python
accuracy_score(y_test, predictions)
```

Out[24]:

```
0.9989291106351603
```

In [25]:

```python
data1=X_test.head(6)
```

In [26]:

```
data1
```

Out[26]:

	Time	V1	V2	V3	V4	V5	V6	V7
96133	65623.0	1.039816	-0.653256	1.173823	0.397209	-1.510419	-0.565747	-0.602646
166412	118065.0	2.126583	-0.779821	-1.113668	-0.537726	-0.984838	-1.035890	-0.989520
17828	28949.0	-1.252038	-4.351770	-0.226020	1.180657	-1.984690	1.332361	0.657343
117010	74510.0	1.092872	0.213336	0.883154	1.273515	-0.510243	-0.432337	-0.086035
252750	155952.0	-3.715808	3.801339	-3.277787	-1.693401	-0.501607	-1.692439	0.128686
58824	48560.0	-0.986125	0.856537	0.757989	-3.045021	-0.256618	-1.744675	0.628714

6 rows × 30 columns

In [27]:

```
y1=y_test.head(6)
```

In [28]:

```
y1
```

Out[28]:

```
96133      '0'
166412     '0'
17828      '0'
117010     '0'
252750     '0'
58824      '0'
Name: Class, dtype: object
```

In [29]:

```
predictions1=logmodel.predict(data1)
```

In [30]:

```
print(predictions1)
```

```
["'0'" "'0'" "'0'" "'0'" "'0'" "'0'"]
```

In [ ]:

```
classification_report(y1, predictions1)
```

In [31]:

```
accuracy_score(y1, predictions1)
```

Out[31]:

```
1.0
```

In [ ]: