credit-card-fraud-detection-2

June 26, 2024

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

[2]:
```
df = pd.read_csv('creditcard.csv')
```

[3]:
```
df
```

[3]:

	Time	V1	V2	V3	V4	V5	\
0	0.0	-1.359807	-0.072781	2.536347	1.378155	-0.338321	
1	0.0	1.191857	0.266151	0.166480	0.448154	0.060018	
2	1.0	-1.358354	-1.340163	1.773209	0.379780	-0.503198	
3	1.0	-0.966272	-0.185226	1.792993	-0.863291	-0.010309	
4	2.0	-1.158233	0.877737	1.548718	0.403034	-0.407193	
…	…	…	…	…	…	…	
284802	172786.0	-11.881118	10.071785	-9.834783	-2.066656	-5.364473	
284803	172787.0	-0.732789	-0.055080	2.035030	-0.738589	0.868229	
284804	172788.0	1.919565	-0.301254	-3.249640	-0.557828	2.630515	
284805	172788.0	-0.240440	0.530483	0.702510	0.689799	-0.377961	
284806	172792.0	-0.533413	-0.189733	0.703337	-0.506271	-0.012546	

	V6	V7	V8	V9	…	V21	V22	\
0	0.462388	0.239599	0.098698	0.363787	…	-0.018307	0.277838	
1	-0.082361	-0.078803	0.085102	-0.255425	…	-0.225775	-0.638672	
2	1.800499	0.791461	0.247676	-1.514654	…	0.247998	0.771679	
3	1.247203	0.237609	0.377436	-1.387024	…	-0.108300	0.005274	
4	0.095921	0.592941	-0.270533	0.817739	…	-0.009431	0.798278	
…	…	…	…	…	…	…	…	
284802	-2.606837	-4.918215	7.305334	1.914428	…	0.213454	0.111864	
284803	1.058415	0.024330	0.294869	0.584800	…	0.214205	0.924384	
284804	3.031260	-0.296827	0.708417	0.432454	…	0.232045	0.578229	
284805	0.623708	-0.686180	0.679145	0.392087	…	0.265245	0.800049	
284806	-0.649617	1.577006	-0.414650	0.486180	…	0.261057	0.643078	

	V23	V24	V25	V26	V27	V28	Amount	\
0	-0.110474	0.066928	0.128539	-0.189115	0.133558	-0.021053	149.62	
1	0.101288	-0.339846	0.167170	0.125895	-0.008983	0.014724	2.69	
2	0.909412	-0.689281	-0.327642	-0.139097	-0.055353	-0.059752	378.66	
3	-0.190321	-1.175575	0.647376	-0.221929	0.062723	0.061458	123.50	

```
4       -0.137458  0.141267 -0.206010  0.502292  0.219422  0.215153   69.99
…             …         …         …         …         …         …      …
284802  1.014480 -0.509348  1.436807  0.250034  0.943651  0.823731    0.77
284803  0.012463 -1.016226 -0.606624 -0.395255  0.068472 -0.053527   24.79
284804 -0.037501  0.640134  0.265745 -0.087371  0.004455 -0.026561   67.88
284805 -0.163298  0.123205 -0.569159  0.546668  0.108821  0.104533   10.00
284806  0.376777  0.008797 -0.473649 -0.818267 -0.002415  0.013649  217.00

        Class
0           0
1           0
2           0
3           0
4           0
…         …
284802      0
284803      0
284804      0
284805      0
284806      0

[284807 rows x 31 columns]
```

[4]:
```
df['Class'].value_counts()
```

[4]:
```
0    284315
1       492
Name: Class, dtype: int64
```

0.0.1 Data Pre-processing

[5]:
```
from sklearn.model_selection import train_test_split
```

[6]:
```
from sklearn.preprocessing import StandardScaler
```

[7]:
```
scalar = StandardScaler()
```

[8]:
```
X = df.drop('Class', axis=1)
y = df.Class
```

[9]:
```
X = scalar.fit_transform(X)
```

[10]:
```
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2,␣
↪random_state=1)
```

0.1 Modeling

[11]:
```
from sklearn.svm import SVC
```

[12]:
```
model_svc = SVC()
```

[13]:
```
model_svc.fit(X_train, y_train)
```

[13]:
```
SVC()
```

[14]:
```
model_svc.score(X_train,y_train)
```

[14]:
```
0.9996752178015756
```

[15]:
```
model_svc.score(X_test,y_test)
```

[15]:
```
0.999385555282469
```

[16]:
```
y_predict = model_svc.predict(X_test)
```

0.2 Implementing Report

[17]:
```
from sklearn.metrics import classification_report , confusion_matrix
```

[18]:
```
import numpy as np
```

[19]:
```
cm = np.array(confusion_matrix(y_test, y_predict, labels=[1,0]))
confusion = pd.DataFrame(cm, index=['is Fraud', 'is␣
 ↪Normal'],columns=['predicted fraud','predicted normal'])
confusion
```

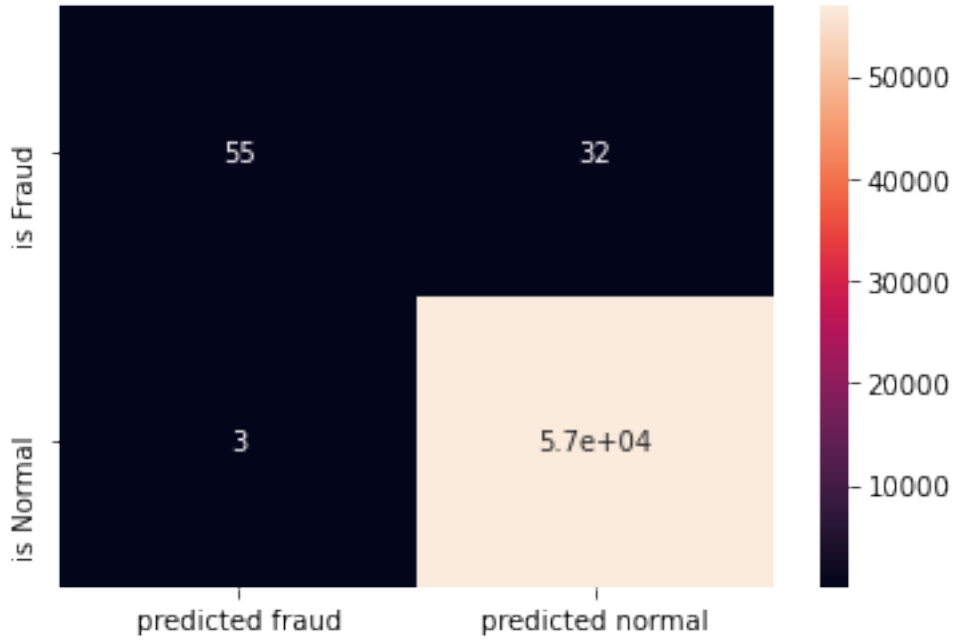
[19]:

	predicted fraud	predicted normal
is Fraud	55	32
is Normal	3	56872

[20]:
```
import seaborn as sns
```

[21]:
```
sns.heatmap(confusion, annot=True)
```

[21]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x1a0374fe948>
```



[22]:
```
print(classification_report(y_test, y_predict))
```

```
              precision    recall  f1-score   support

           0       1.00      1.00      1.00     56875
           1       0.95      0.63      0.76        87

    accuracy                           1.00     56962
   macro avg       0.97      0.82      0.88     56962
weighted avg       1.00      1.00      1.00     56962
```