Credit Card Fraud Detection Using Machine Learning Algorithms

Upload your input CSV file

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card_transdata.csv 72.7MB

First 5 rows of the data:

	distance_from_home	distance_from_last_transaction	ratio_to_median_purchase_price	repeat_retailer
0	57.8779	0.3111	1.9459	1
1	10.8299	0.1756	1.2942	1
2	5.0911	0.8052	0.4277	1
3	2.2476	5.6	0.3627	1
4	44.1909	0.5665	2.2228	1

Shape of the data:

```
(1000000, 8)
```

Data types of the columns:

	0
distance_from_home	float64
distance_from_last_transaction	float64
ratio_to_median_purchase_price	float64
repeat_retailer	float64
used_chip	float64
used_pin_number	float64
online_order	float64
fraud	float64

Summary statistics of the data:

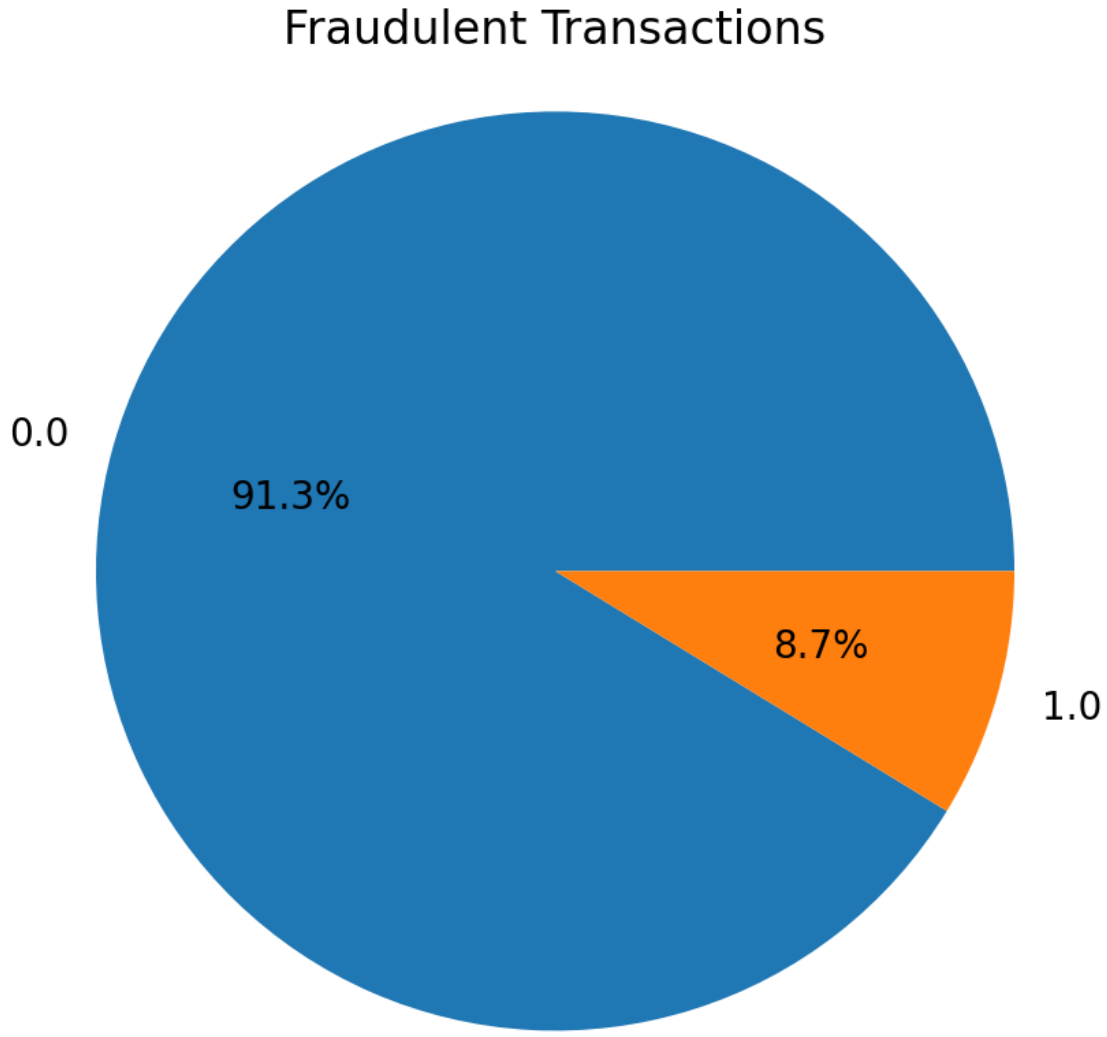
	distance_from_home	distance_from_last_transaction	ratio_to_median_purchase_price	repeat_retailer
count	1,000,000	1,000,000	1,000,000	1,000,000
mean	26.6288	5.0365	1.8242	0.8815
std	65.3908	25.8431	2.7996	0.3232
min	0.0049	0.0001	0.0044	0
25%	3.878	0.2967	0.4757	1
50%	9.9678	0.9987	0.9977	1
75%	25.744	3.3557	2.0964	1
max	10,632.7237	11,851.1046	267.8029	1

Missing values in the data:

	0
distance_from_home	0
distance_from_last_transaction	0
ratio_to_median_purchase_price	0
repeat_retailer	0
used_chip	0
used_pin_number	0
online_order	0
fraud	0

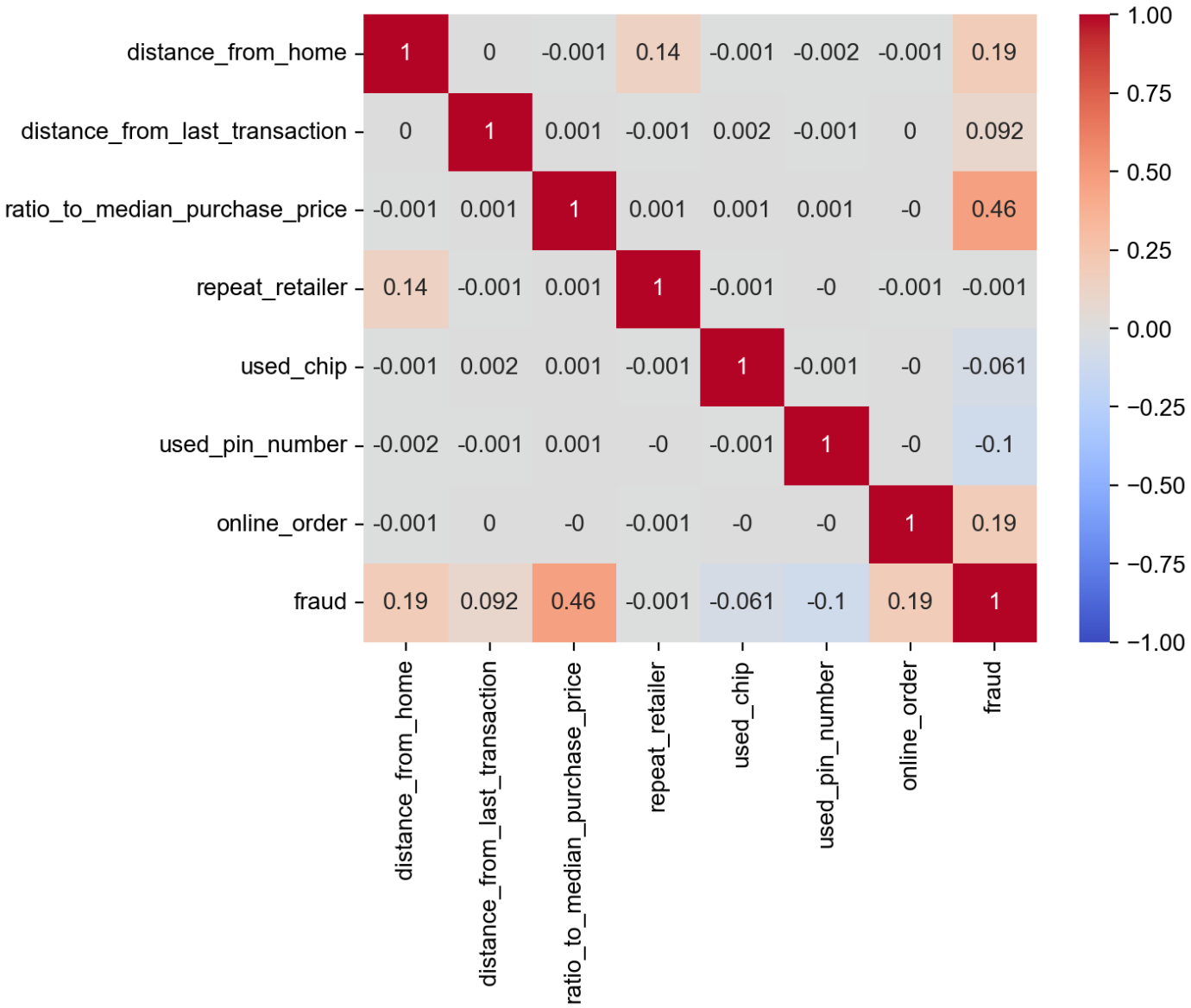
Correlation matrix of the data:

	distance_from_home	distance_from_last_transaction	ratio_to_median_purch
distance_from_home	1	0.0002	
distance_from_last_transaction	0.0002	1	
ratio_to_median_purchase_price	-0.0014	0.001	
repeat_retailer	0.1431	-0.0009	
used_chip	-0.0007	0.0021	
used_pin_number	-0.0016	-0.0009	
online_order	-0.0013	0.0001	
fraud	0.1876	0.0919	

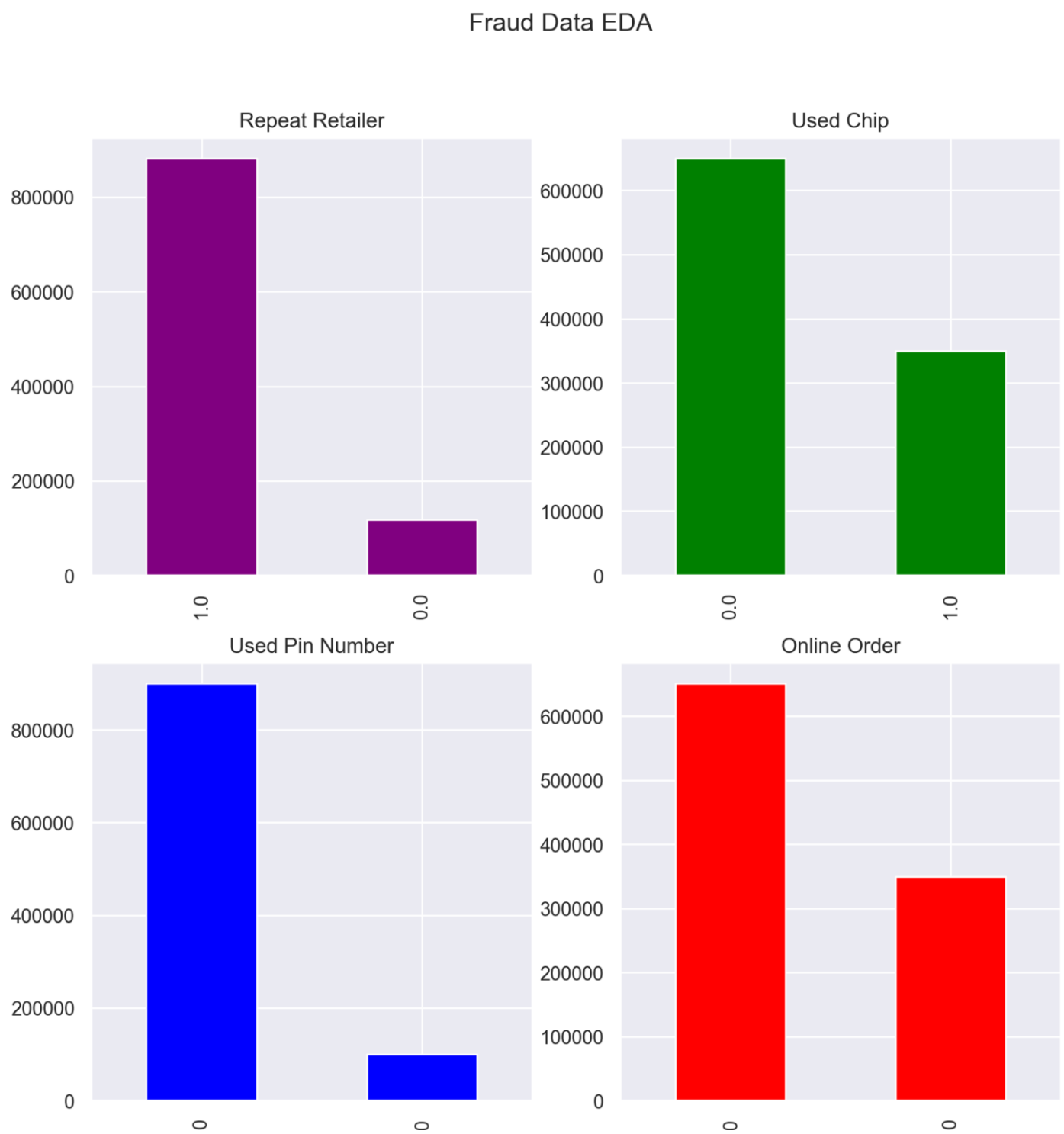


Percentage of Fraud and Non-Fraud Records

Correlation Matrix (Heat Map)



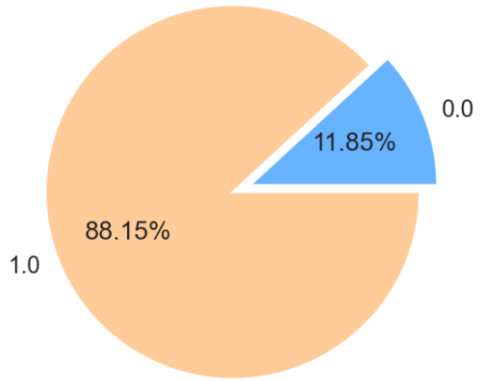
Fraud Data EDA


Fraud Data EDA
Repeat Retailer
800000
600000
400000
200000
0
1.0
0.0
Used Chip
600000
500000
400000
300000
200000
100000
0
0.0
1.0
Used Pin Number
800000
600000
400000
200000
0
0
0
Online Order
600000
500000
400000
300000
200000
100000
0
0
0

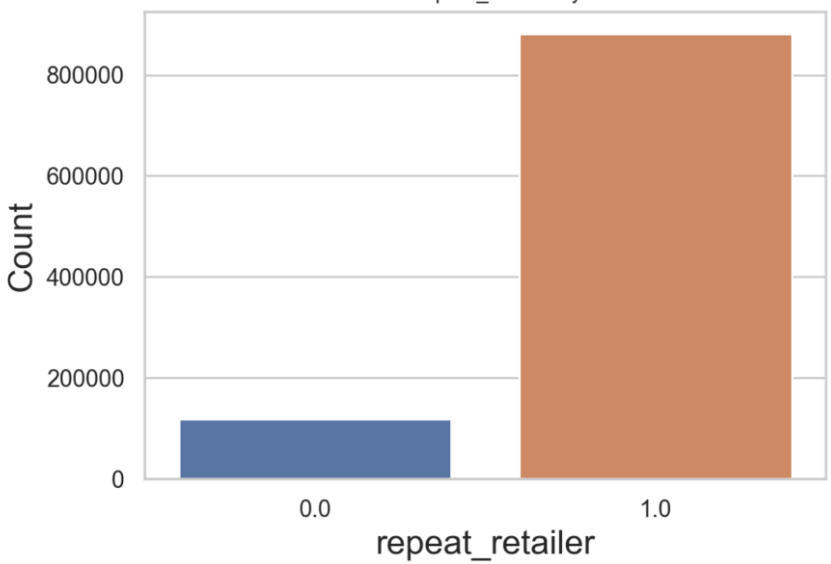
0.
1.
1.
0.

Categorical Variables Plot

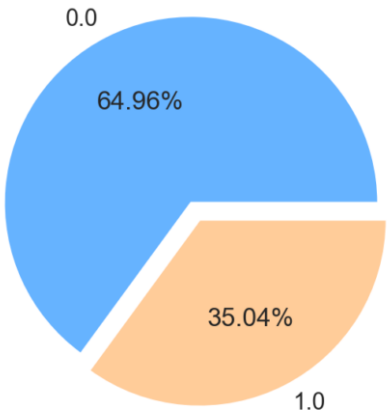
Distribution of repeat_retailer



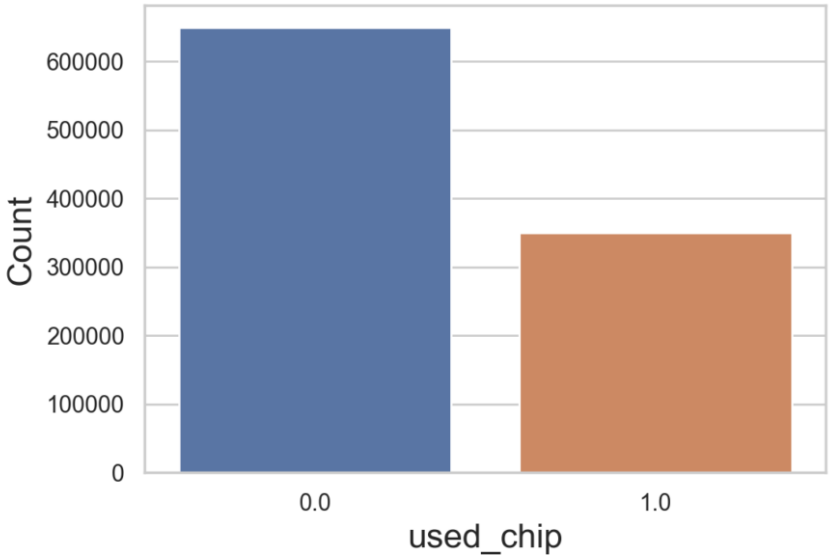
Count of repeat_retailer by Class



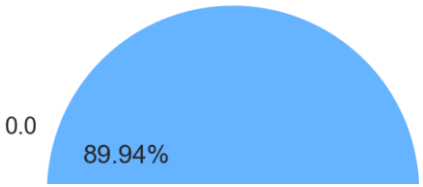
Distribution of used_chip



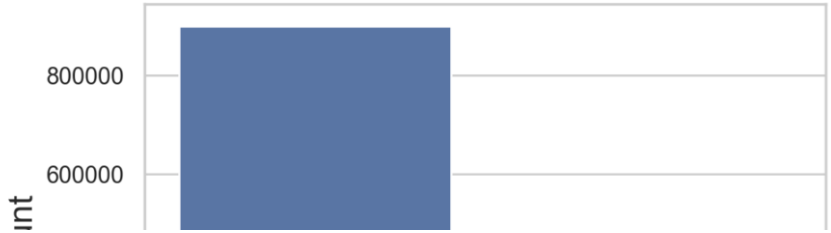
Count of used_chip by Class

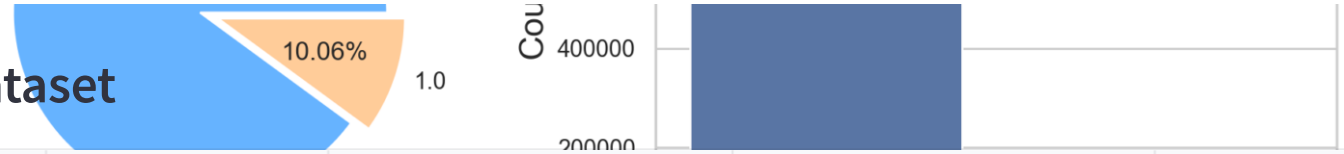


Distribution of used_pin_number



Count of used_pin_number by Class





Dataset

	distance_from_home	distance_from_last_transaction	ratio_to_median_purchase_price	repeat_retailer
0	57.8779	0.3111	1.9459	1
1	10.8299	0.1756	1.2942	1
2	5.0911	0.8052	0.4277	1
3	2.2476	5.6	0.3627	1
4	44.1909	0.5665	2.2228	1
5	5.5864	13.2611	0.0648	1
6	3.724	0.9568	0.2785	1
7	4.8482	0.3207	1.273	1
8	0.8766	2.5036	1.517	0
9	8.839	2.9705	2.3617	1

Feature Columns


```
[
  0 : "distance_from_home"
  1 : "distance_from_last_transaction"
  2 : "ratio_to_median_purchase_price"
  3 : "repeat_retailer"
  4 : "used_chip"
```

```
    5 : "used_pin_number"
    6 : "online_order"
]
```

Target Variable

fraud

Training and Testing Sets

X_train: `(800000, 7)`

y_train: `(800000,)`

X_test: `(200000, 7)`

y_test: `(200000,)`

Accuracy of logistic regression classifier on test set:

0.95800

Classification Report

```
  precision    recall  f1-score   support

         0.0   0.962066  0.993127  0.977350    182460
         1.0   0.892351  0.592645  0.712255     17540

    accuracy                       0.958005    200000
```

```
   macro avg   0.927208  0.792886  0.844802    200000
weighted avg   0.955952  0.958005  0.954101    200000
```

Accuracy of decision tree classifier on test set:

0.99999

Classification Report

```
  precision    recall  f1-score   support

         0.0   1.000000  0.999984  0.999992    182460
         1.0   0.999829  1.000000  0.999914     17540

    accuracy                       0.999985    200000
   macro avg   0.999914  0.999992  0.999953    200000
weighted avg   0.999985  0.999985  0.999985    200000
```

Accuracy of Random Forest Classifier on test set:

1.00000

Classification Report

```
  precision    recall  f1-score   support

         0.0   1.000000  1.000000  1.000000    182460
         1.0   1.000000  1.000000  1.000000     17540
```

accuracy			1.000000	200000
macro avg	1.000000	1.000000	1.000000	200000
weighted avg	1.000000	1.000000	1.000000	200000