CREATING THE FINAL DATASET

IMPORTING THE RAW DATASET

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

In [2]:
```
dataset = pd.read_csv('../dataset/project_dataset.csv')
```

In [3]:
```
dataset.head()
```

Out[3]:

	trans_id	trans_datetime	merchant	category	card_number	card_holder_name	gender	dob	trans_amou
0	0b242abb623afc578575680df30655b9	01-01-2019 00:00	fraud_Rippin, Kub and Mann	misc_net	2.700000e+15	Jennifer Banks	F	09-03-1988	4.9
1	1f76529f8574734946361c461b024d99	01-01-2019 00:00	fraud_Heller, Gutmann and Zieme	grocery_pos	6.300000e+11	Stephanie Gill	F	21-06-1978	107.2
2	a1a22d70485983eac12b5b88dad1cf95	01-01-2019 00:00	fraud_Lind-Buckridge	entertainment	3.890000e+13	Edward Sanchez	M	19-01-1962	220.1
3	6b849c168bdad6f867558c3793159a81	01-01-2019 00:01	fraud_Kutch, Hermiston and Farrell	gas_transport	3.530000e+15	Jeremy White	M	12-01-1967	45.0
4	a41d7549acf90789359a9aa5346dcb46	01-01-2019 00:03	fraud_Keeling-Crist	misc_pos	3.760000e+14	Tyler Garcia	M	28-03-1986	41.9

ANALYSING THE DATASET

In [4]:
```
dataset.shape
```

Out[4]:
```
(1048575, 12)
```

In [5]:
```
dataset.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1048575 entries, 0 to 1048574
Data columns (total 12 columns):
 #   Column            Non-Null Count    Dtype  
---  ------            --------------    -----  
 0   trans_id          1048575 non-null  object 
 1   trans_datetime    1048575 non-null  object 
 2   merchant          1048575 non-null  object 
 3   category          1048575 non-null  object 
 4   card_number       1048575 non-null  float64
 5   card_holder_name  1048575 non-null  object 
 6   gender            1048575 non-null  object 
 7   dob               1048575 non-null  object 
 8   trans_amount      1048575 non-null  float64
 9   state             1048575 non-null  object 
 10  zip               1048575 non-null  int64  
 11  fraud_risk        1048575 non-null  int64  
dtypes: float64(2), int64(2), object(8)
memory usage: 96.0+ MB
```

In [6]:
```
fraud = dataset[dataset['fraud_risk'] == 1]
valid = dataset[dataset['fraud_risk'] == 0]
```

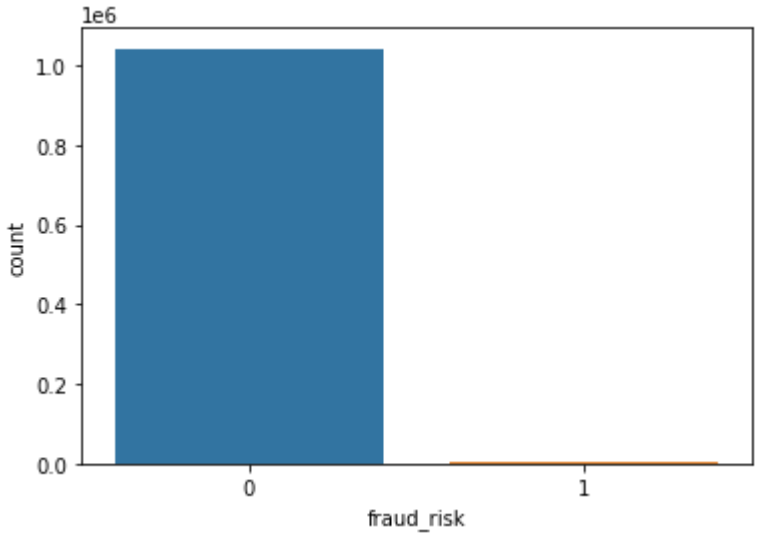
In [7]:
```
print("Number of fraud data :", len(fraud))
print("Number of valid data :", len(valid))
```

```
Number of fraud data : 6006
Number of valid data : 1042569
```

In [8]:
```
import seaborn as sns
```

In [9]:
```
sns.countplot(x = 'fraud_risk', data = dataset)
```

Out[9]:
```
<AxesSubplot:xlabel='fraud_risk', ylabel='count'>
```



BALANCING THE DATASET USING "UNDER-SAMPLING"

In [10]:
```
valid = valid.sample(len(fraud))
```

In [11]:
```
dataset = pd.concat([valid, fraud], axis = 0)
```

In [12]:
```
dataset = dataset.sort_index()
```

In [13]:
```
dataset.reset_index(drop = True, inplace = True)
```

CALCULATING THE TRANSACTION TIME, DAY, MONTH, AND YEAR

In [14]:
```
dataset['trans_datetime'] = pd.to_datetime(dataset['trans_datetime'])
```

In [15]:
```
dataset.insert(2, 'trans_hour', dataset['trans_datetime'].dt.hour)
dataset.insert(3, 'trans_day', dataset['trans_datetime'].dt.day)
dataset.insert(4, 'trans_month', dataset['trans_datetime'].dt.month)
dataset.insert(5, 'trans_year', dataset['trans_datetime'].dt.year)
```

CALCULATING THE AGE

In [16]:
```
dataset['dob'] = pd.to_datetime(dataset['dob'])
```

In [17]:
```
import numpy as np
```

In [18]:
```
dataset.insert(11, 'age', np.round((dataset['trans_datetime'] - dataset['dob']) // np.timedelta64(1, 'Y')))
```

DELETING THE REDUNDANT FEATURES

In [19]:
```
del dataset['trans_id']
del dataset['trans_datetime']
del dataset['merchant']
del dataset['card_holder_name']
del dataset['gender']
del dataset['dob']
```

In [20]:
```
dataset.head()
```

Out[20]:

	trans_hour	trans_day	trans_month	trans_year	category	card_number	age	trans_amount	state	zip	fraud_risk
0	0	1	1	2019	misc_net	4.640000e+15	31	177.57	UT	84540	0
1	7	1	1	2019	shopping_net	4.490000e+18	89	4.56	SC	29170	0
2	8	1	1	2019	misc_net	2.510000e+15	62	3.49	MI	48088	0
3	8	1	1	2019	grocery_pos	4.590000e+12	65	84.04	MO	64470	0
4	9	1	1	2019	shopping_net	3.510000e+15	59	8.08	WV	25049	0

USING LABELENCODER

In [21]:
```
from sklearn.preprocessing import LabelEncoder
labelencoder = LabelEncoder()
```

In [22]:
```
dataset['category'] = labelencoder.fit_transform(dataset['category'])
dataset['state'] = labelencoder.fit_transform(dataset['state'])
```

In [23]:
```
dataset.head()
```

Out[23]:

	trans_hour	trans_day	trans_month	trans_year	category	card_number	age	trans_amount	state	zip	fraud_risk
0	0	1	1	2019	8	4.640000e+15	31	177.57	44	84540	0
1	7	1	1	2019	11	4.490000e+18	89	4.56	40	29170	0
2	8	1	1	2019	8	2.510000e+15	62	3.49	22	48088	0
3	8	1	1	2019	4	4.590000e+12	65	84.04	24	64470	0
4	9	1	1	2019	11	3.510000e+15	59	8.08	49	25049	0

SAVING THE FINAL DATASET

In [24]:
```
import os.path
```

In [25]:
```
if os.path.isfile('../dataset/train_dataset.csv') is False:
    dataset.to_csv('../dataset/train_dataset.csv')
```

ANALYSING THE UPDATED DATASET

In [26]:
```
dataset.shape
```

Out[26]:
```
(12012, 11)
```

In [27]:
```
dataset.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 12012 entries, 0 to 12011
Data columns (total 11 columns):
 #   Column        Non-Null Count  Dtype  
---  ------        --------------  -----  
 0   trans_hour    12012 non-null  int64  
 1   trans_day     12012 non-null  int64  
 2   trans_month   12012 non-null  int64  
 3   trans_year    12012 non-null  int64  
 4   category      12012 non-null  int32  
 5   card_number   12012 non-null  float64
 6   age           12012 non-null  int64  
```

```
 7   trans_amount  12012 non-null  float64
 8   state         12012 non-null  int32
 9   zip           12012 non-null  int64
 10  fraud_risk    12012 non-null  int64
dtypes: float64(2), int32(2), int64(7)
memory usage: 938.6 KB
```

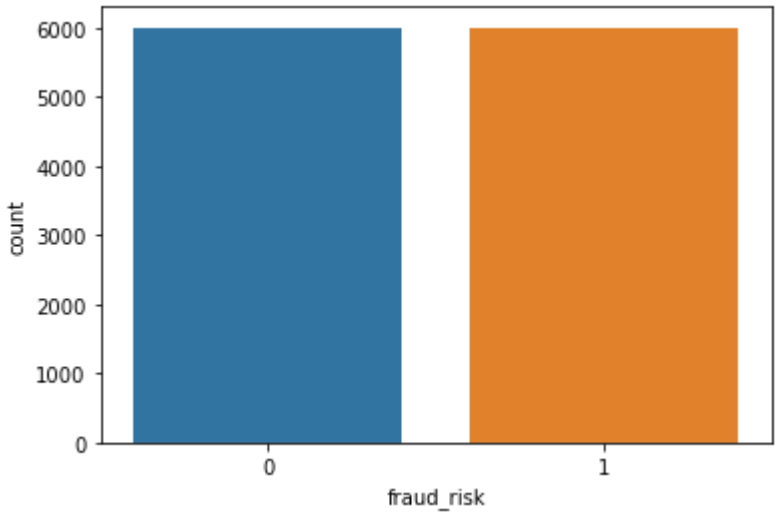
In [28]:
```
fraud = dataset[dataset['fraud_risk'] == 1]
valid = dataset[dataset['fraud_risk'] == 0]
```

In [29]:
```
print("Number of fraud data :", len(fraud))
print("Number of valid data :", len(valid))
```

```
Number of fraud data : 6006
Number of valid data : 6006
```

In [30]:
```
sns.countplot(x = 'fraud_risk', data = dataset)
```

Out[30]:
```
<AxesSubplot:xlabel='fraud_risk', ylabel='count'>
```



In [31]:
```
dataset.nunique()
```

Out[31]:
```
trans_hour        24
trans_day         31
trans_month       12
```

```
trans_year         2
category          14
card_number      318
age               83
trans_amount    9543
state             51
zip              941
fraud_risk         2
dtype: int64
```

In [ ]: