Predict the Criminal

Import Libraries

In [1]:

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

Get the Data

In [2]:

```
train = pd.read_csv('criminal_train.csv')
test = pd.read_csv('criminal_test.csv')
```

In [3]:

```
train.head()
```

Out[3]:

	PERID	IFATHER	NRCH17_2	IRHHSIZ2	IIHHSIZ2	IRKI17_2	IIKI17_2	IRHH65_2	I
0	25095143	4	2	4	1	3	1	1	1
1	13005143	4	1	3	1	2	1	1	1
2	67415143	4	1	2	1	2	1	1	1
3	70925143	4	0	2	1	1	1	1	1
4	75235143	1	0	6	1	4	1	1	1

5 rows × 72 columns

In [4]:

```
test.head()
```

Out[4]:

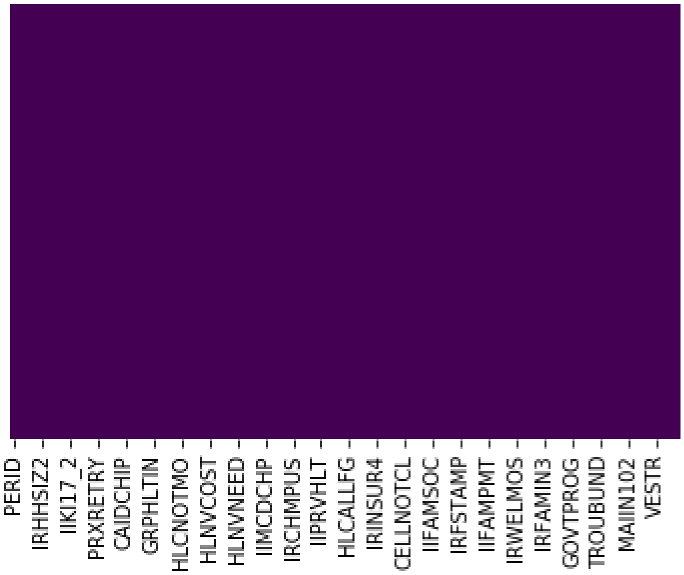
	PERID	IFATHER	NRCH17_2	IRHHSIZ2	IIHHSIZ2	IRKI17_2	IIKI17_2	IRHH65_2	I
0	66583679	4	0	4	1	2	1	1	1
1	35494679	4	0	4	1	1	1	1	1
2	79424679	2	0	3	1	2	1	1	1
3	11744679	4	0	6	1	2	1	1	1
4	31554679	1	0	4	1	3	1	1	1

5 rows × 71 columns

Exploratory Data Analysis

```
In [5]: sns.heatmap(train.isnull(),yticklabels=False,cbar=False,cmap='viridi
        s')
```

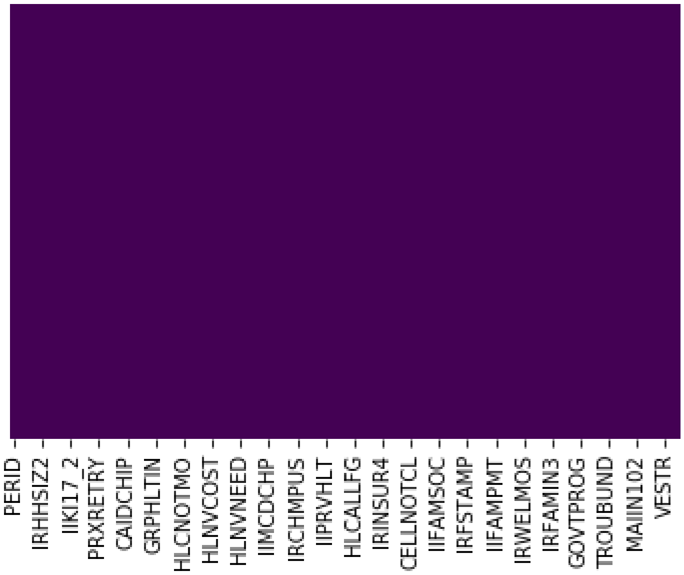
```
Out[5]: <matplotlib.axes._subplots.AxesSubplot at 0x7fc1f6961710>
```



Train data do not have any Null values

```
In [6]: sns.heatmap(test.isnull(),yticklabels=False,cbar=False,cmap='viridis'
        )
```

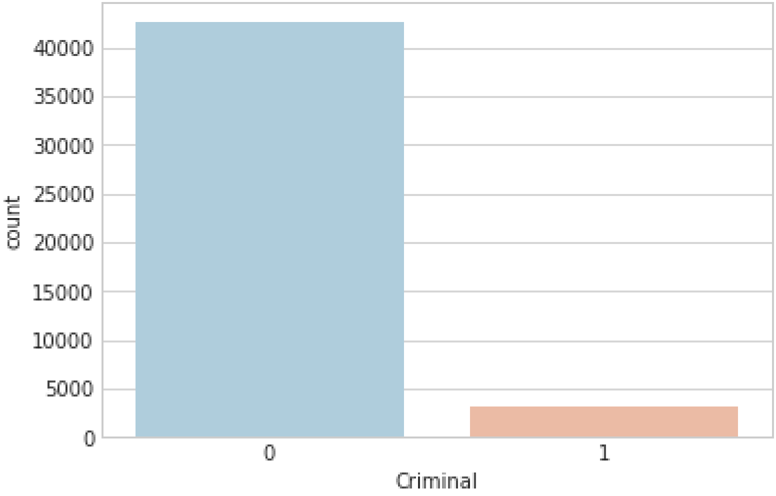
```
Out[6]: <matplotlib.axes._subplots.AxesSubplot at 0x7fc1f43158d0>
```



test data do not have any Null values

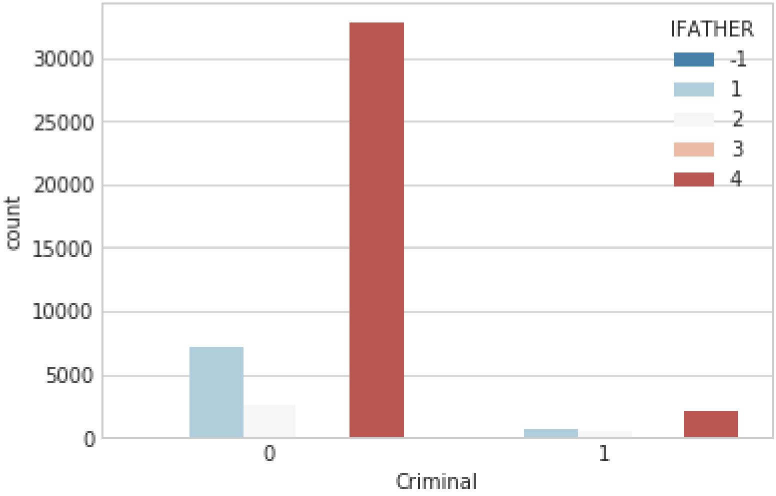
```
In [7]: sns.set_style('whitegrid')
        sns.countplot(x='Criminal',data=train,palette='RdBu_r')

Out[7]: <matplotlib.axes._subplots.AxesSubplot at 0x7fc1f6cabac8>
```



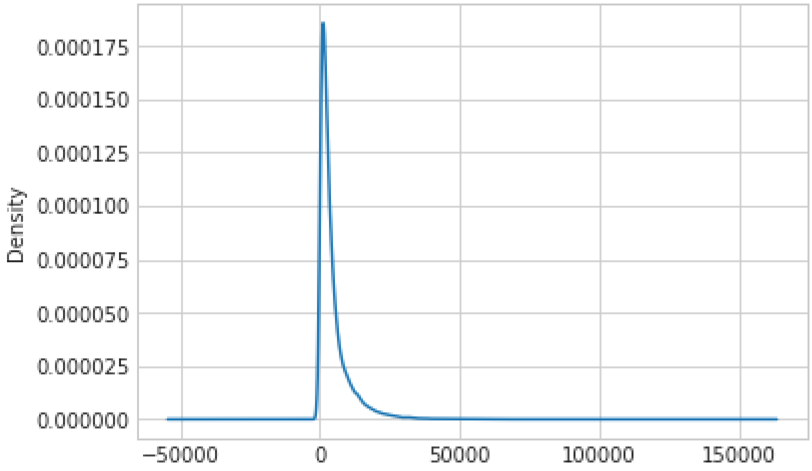
```
In [8]: sns.set_style('whitegrid')
        sns.countplot(x='Criminal',hue='IFATHER',data=train,palette='RdBu_r')

Out[8]: <matplotlib.axes._subplots.AxesSubplot at 0x7fc1f41d7e48>
```



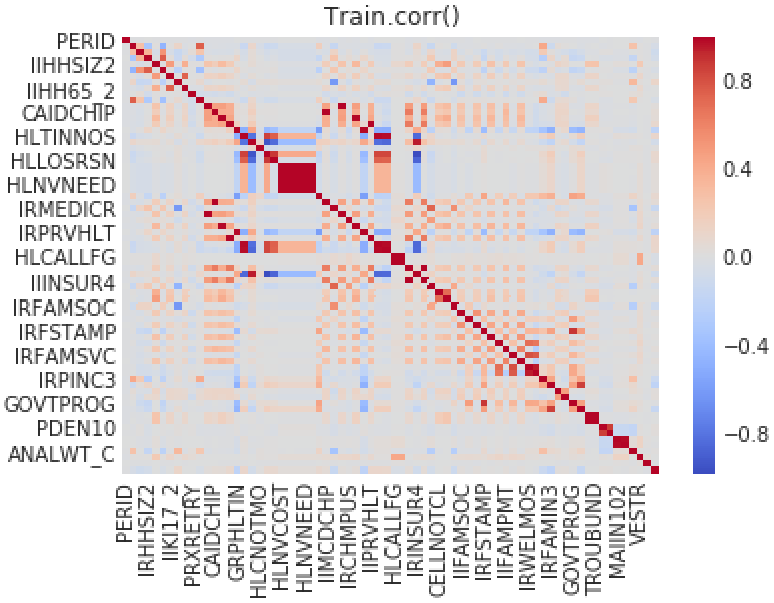
```
In [9]: train['ANALWT_C'].plot.kde()
```

```
Out[9]: <matplotlib.axes._subplots.AxesSubplot at 0x7fc1f4150198>
```

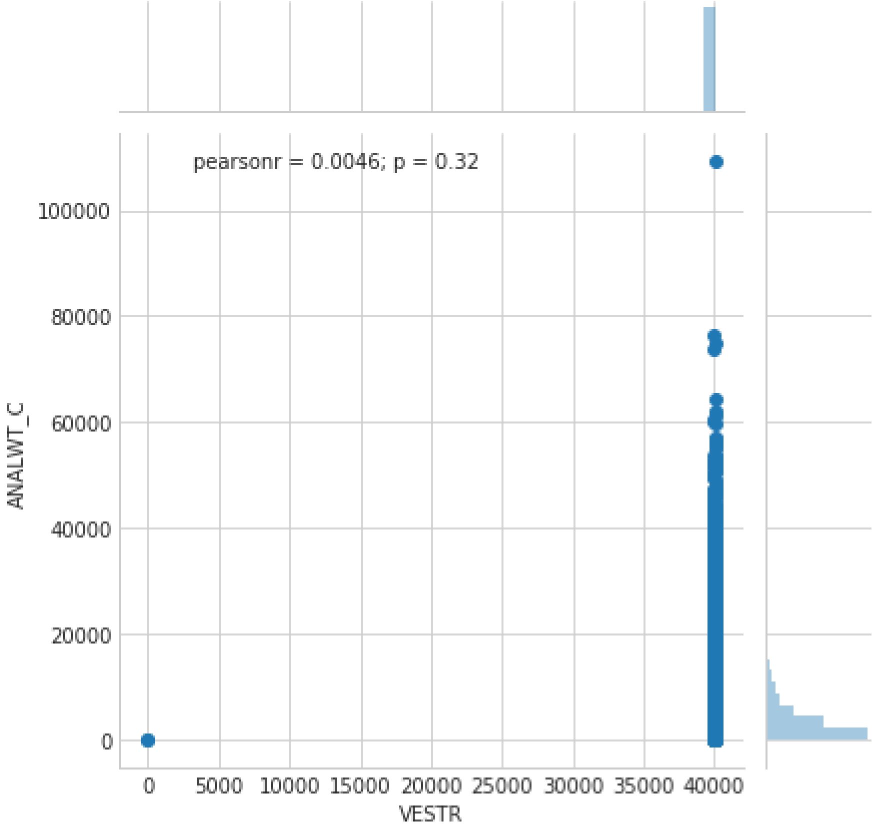


```
In [11]: sns.heatmap(train.corr(),cmap='coolwarm')
         plt.title('Train.corr()')
```

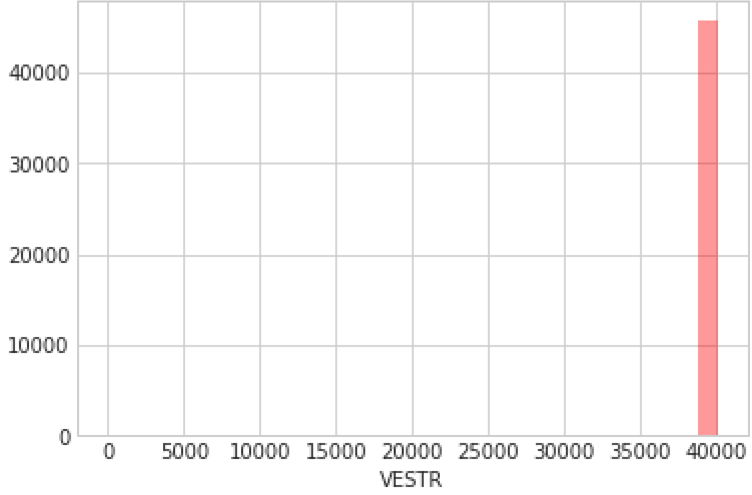
```
Out[11]: Text(0.5,1,'Train.corr()')
```



```
In [14]: sns.jointplot(x="VESTR", y="ANALWT_C", data=train);
```



```
In [12]: sns.distplot(train['VESTR'],bins=30,kde=False,color='red')
Out[12]: <matplotlib.axes._subplots.AxesSubplot at 0x7fc1ed26a710>
```



```
In [ ]:
```

Data Cleaning

Drop unnecessary column PERID

```
In [26]: train.drop("PERID",axis=1,inplace=True)
```

```
In [27]: train.shape
```

```
Out[27]: (45718, 71)
```

```
In [28]: test.shape
```

```
Out[28]: (11430, 71)
```

Building a Model

Train-Test Split

Split the data into Training testing set

```
In [29]: X_train = train.drop('Criminal', axis=1)
         y_train = train['Criminal']
         X_test = test.drop('PERID', axis=1)
```

Random Forest

Training and Predicting

We'll start training using Random Forest.

```
In [30]: from sklearn.ensemble import RandomForestClassifier
```

```
In [31]: random_forest = RandomForestClassifier(n_estimators=100)
         random_forest.fit(X_train, y_train)
```

```
Out[31]: RandomForestClassifier(bootstrap=True, class_weight=None, criterion
         ='gini',
                     max_depth=None, max_features='auto', max_leaf_nodes=None,
                     min_impurity_decrease=0.0, min_impurity_split=None,
                     min_samples_leaf=1, min_samples_split=2,
                     min_weight_fraction_leaf=0.0, n_estimators=100, n_jobs=1,
                     oob_score=False, random_state=None, verbose=0,
                     warm_start=False)
```

```
In [32]: RFC_prediction = random_forest.predict(X_test)
In [33]: random_forest.score(X_train, y_train)

Out[33]: 0.99995625355439866
```

Result file into .csv

```
In [43]: submission = pd.DataFrame({
             "PERID": test["PERID"],
             "Criminal": RFC_prediction,
             })
         submission.to_csv('Result.csv', index=False, columns=['PERID', 'Crimi
         nal'])
```

```
In [44]: result = pd.read_csv('Result1.csv')
         result.head()
```

Out[44]:

	PERID	Criminal
0	66583679	0
1	35494679	0
2	79424679	0
3	11744679	0
4	31554679	0

```
In [ ]:
```