

Python 3.6.0 |Continuum Analytics, Inc.| (default, Dec 23 2016, 11:57:41) [MSC v.1900 64 bit (AMD64)]
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IPython 7.3.0 -- An enhanced Interactive Python.

```
In [1]: runfile('D:/Docs/Courses/CS/CS2750/OutlierDetection.py', wdir='D:/Docs/Courses/CS/CS2750')
```

D:/Docs/Courses/CS/CS2750/OutlierDetection.py:117: FutureWarning: Method .as_matrix will be removed in a future version. Use .values instead.

```
X = X.as_matrix()
```

```
=====Elliptic Envelope Parameter=====
{'assume_centered': False, 'contamination': 0.1, 'random_state': None, 'store_precision': True, 'support_fraction': 1}
=====Elliptic Envelope Performance=====
```

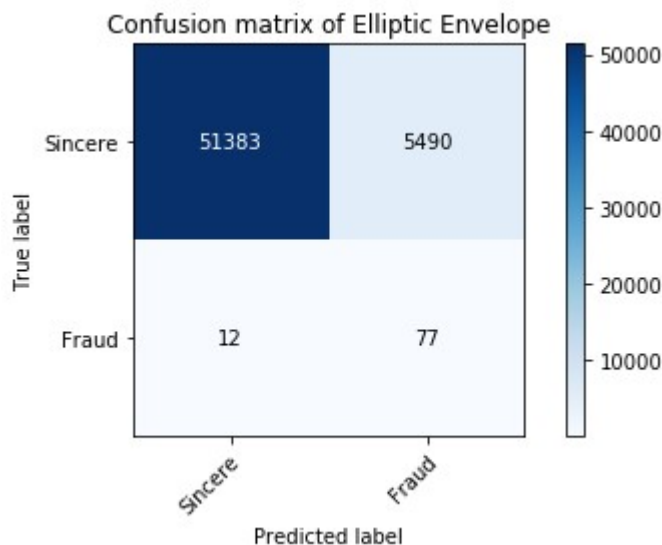
	precision	recall	f1-score	support
Sincere	1.00	0.90	0.95	56873
Fraud	0.01	0.87	0.03	89
micro avg	0.90	0.90	0.90	56962
macro avg	0.51	0.88	0.49	56962
weighted avg	1.00	0.90	0.95	56962

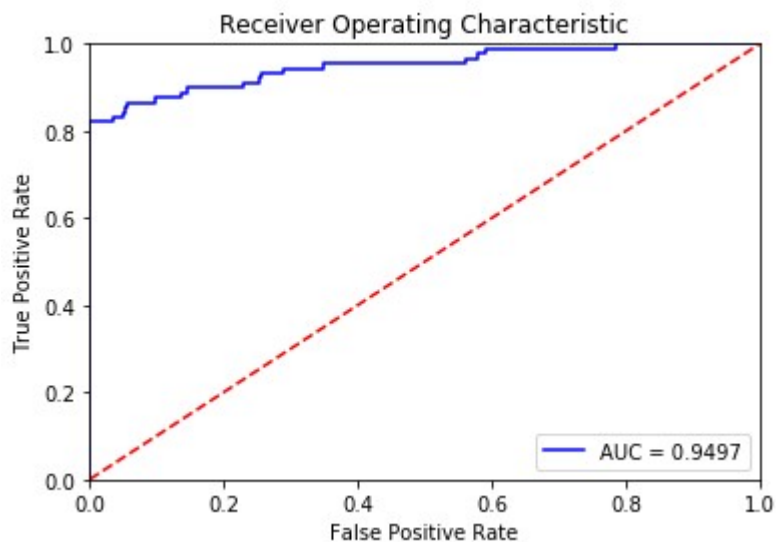
Confusin Matix:

Confusion matrix, without normalization

```
[[51383  5490]
 [   12    77]]
```

ROC curve:





The AUC is:0.9497061953728166

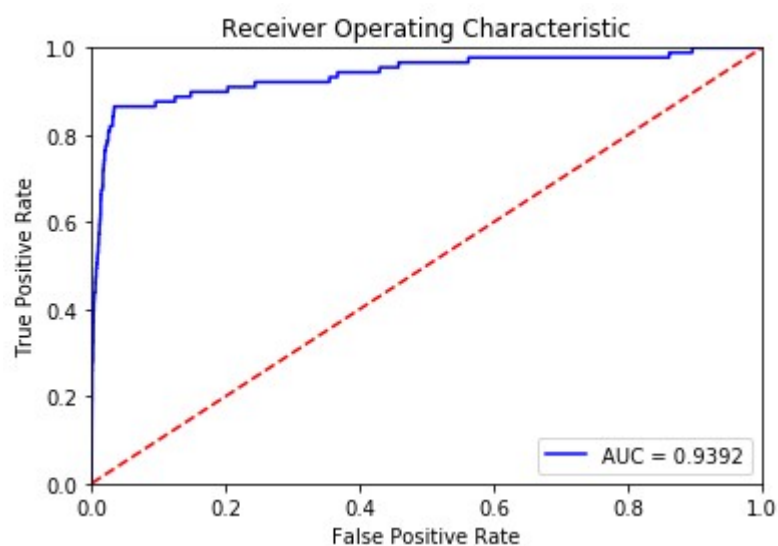
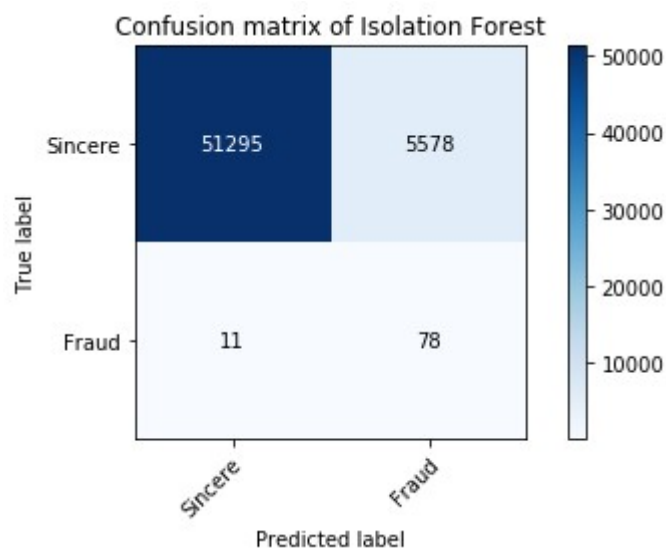
```
=====Isolation Forest Parameters=====
{'behaviour': 'old', 'bootstrap': False, 'contamination': 'legacy', 'max_features': 1.0,
 'max_samples': 'auto', 'n_estimators': 100, 'n_jobs': None, 'random_state': None,
 'verbose': 0}
C:\Users\Dai\Anaconda3\envs\cs2731\lib\site-packages\sklearn\ensemble\iforest.py:213:
FutureWarning: default contamination parameter 0.1 will change in version 0.22 to "auto".
This will change the predict method behavior.
FutureWarning)
```

```
=====Isolation Forest Performance=====
precision    recall  f1-score   support

Sincere      1.00    0.90    0.95    56873
Fraud        0.01    0.88    0.03      89

micro avg    0.90    0.90    0.90   56962
macro avg    0.51    0.89    0.49   56962
weighted avg 1.00    0.90    0.95   56962
```

```
Confusin Matix:
Confusion matrix, without normalization
[[51295  5578]
 [   11    78]]
ROC curve:
```



The AUC is:0.9392022082712577

=====One-Class SVM Parameter=====

```
{'cache_size': 200, 'coef0': 0.0, 'degree': 3, 'gamma': 'auto', 'kernel': 'rbf',
'max_iter': -1, 'nu': 0.002, 'random_state': None, 'shrinking': True, 'tol': 0.001,
'verbose': False}
```

=====One-Class SVM Performance=====

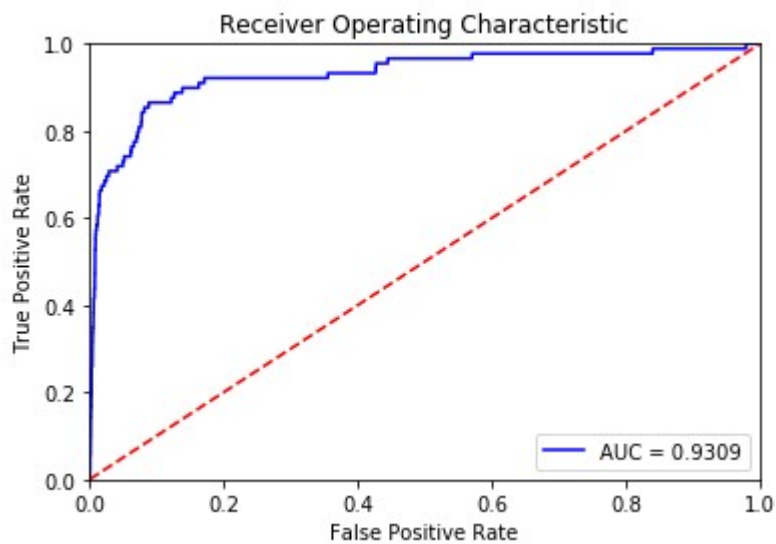
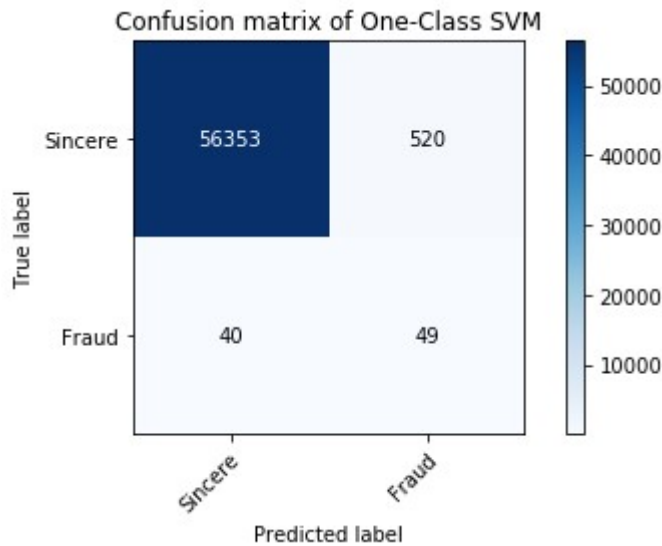
	precision	recall	f1-score	support
Sincere	1.00	0.99	1.00	56873
Fraud	0.09	0.55	0.15	89
micro avg	0.99	0.99	0.99	56962
macro avg	0.54	0.77	0.57	56962
weighted avg	1.00	0.99	0.99	56962

Confusin Matix:

Confusion matrix, without normalization

```
[[56353  520]
 [   40   49]]
```

ROC curve:



The AUC is:0.9308834566747081

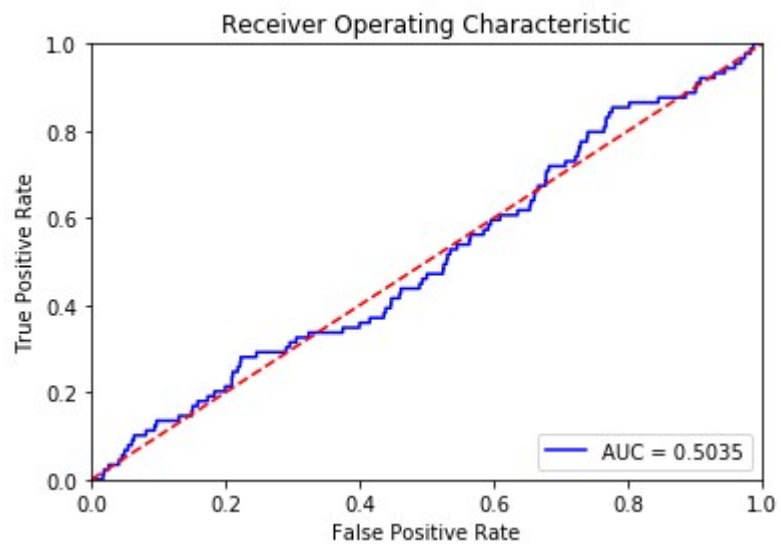
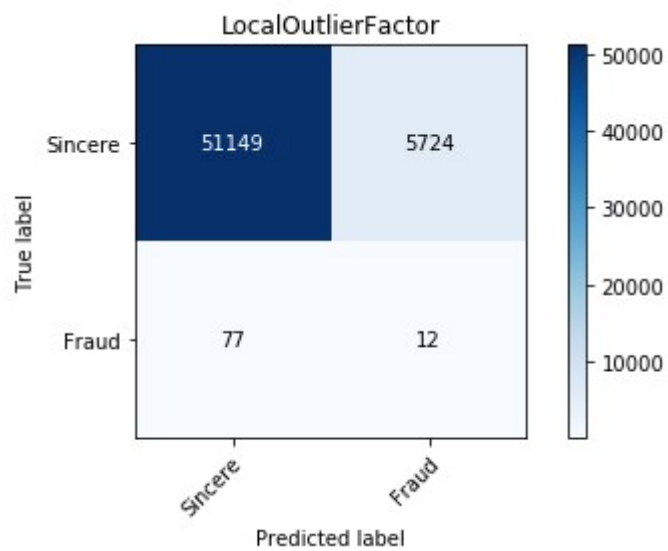
```
=====LocalOutlierFactor Parameter=====
{'algorithm': 'auto', 'contamination': 'legacy', 'leaf_size': 30, 'metric': 'minkowski',
'metric_params': None, 'n_jobs': None, 'n_neighbors': 20, 'novelty': True, 'p': 2}
C:\Users\Dai\Anaconda3\envs\cs2731\lib\site-packages\sklearn\neighbors\lof.py:236:
FutureWarning: default contamination parameter 0.1 will change in version 0.22 to "auto".
This will change the predict method behavior.
FutureWarning)
```

```
=====LocalOutlierFactor Performance=====
      precision    recall  f1-score   support

   Sincere       1.00      0.90      0.95     56873
    Fraud       0.00      0.13      0.00         89

 micro avg       0.90      0.90      0.90     56962
 macro avg       0.50      0.52      0.48     56962
 weighted avg       1.00      0.90      0.94     56962
```

Confusin Matix:
Confusion matrix, without normalization
[[51149 5724]
[77 12]]
ROC curve:



The AUC is:0.5034981351116039

In [2]: