

```
>>>
```

```
= RESTART: /Users/manvirkaur/Desktop/5/EECS 658/ManvirKaur_Assignment5/imbalanced.py
```

```
*****
```

```
Part 1
```

```
*****
```

```
Accuracy: 0.9833333333333333
```

```
Confusion Matrix:
```

```
[[40 0 0]
```

```
 [ 0 28 2]
```

```
 [ 0 0 50]]
```

```
Class Balance Accuracy: 0.9466666666666667
```

```
Balanced Accuracy: 0.989247311827957
```

```
balanced_accuracy_score: 0.9777777777777779
```

```
*****
```

```
*****
```

```
Part 2
```

```
*****
```

```
*****
```

```
Random Oversampling
```

```
*****
```

```
Accuracy: 0.9733333333333334
```

```
Confusion Matrix:
```

```
[[50 0 0]
```

```
 [ 0 47 3]
```

```
 [ 0 1 49]]
```

```
*****
```

```
*****
```

```
SMOTE Oversampling
```

```
*****
```

```
Accuracy: 0.9733333333333334
```

```
Confusion Matrix:
```

```
[[50 0 0]
```

```
 [ 0 46 4]
```

```
 [ 0 0 50]]
```

```
*****
```

ADASYN Oversampling

Accuracy: 0.9574468085106383

Confusion Matrix:

[[40 0 0]

[0 47 4]

[0 2 48]]

Part 3

Random Undersampling

Accuracy: 0.9444444444444444

Confusion Matrix:

[[30 0 0]

[0 27 3]

[0 2 28]]

Warning (from warnings module):

File "/Library/Frameworks/Python.framework/Versions/3.9/lib/python3.9/site-packages/sklearn/cluster/_kmeans.py", line 1412

super()._check_params_vs_input(X, default_n_init=10)

FutureWarning: The default value of `n_init` will change from 10 to 'auto' in 1.4. Set the value of `n_init` explicitly to suppress the warning

Warning (from warnings module):

File "/Library/Frameworks/Python.framework/Versions/3.9/lib/python3.9/site-packages/threadpoolctl.py", line 1019

warnings.warn(

RuntimeWarning: libc not found. The ctypes module in Python 3.9 is maybe too old for this OS.

Warning (from warnings module):

File "/Library/Frameworks/Python.framework/Versions/3.9/lib/python3.9/site-packages/sklearn/cluster/_kmeans.py", line 1412

super()._check_params_vs_input(X, default_n_init=10)

FutureWarning: The default value of `n_init` will change from 10 to 'auto' in 1.4. Set the value of `n_init` explicitly to suppress the warning

Cluster Undersampling

Accuracy: 0.9777777777777777

Confusion Matrix:

[[30 0 0]

[0 28 2]

[0 0 30]]

TomekLinks Undersampling

Accuracy: 0.9747899159663865

Confusion Matrix:

[[40 0 0]

[0 27 3]

[0 0 49]]
