|  |  |  |  |
| --- | --- | --- | --- |
| Classifier | Parameter1 | Parameter2 | Cross Validation Accuracy Score |
| Decision Tree | criterion=entropy |  | 0.495876185 |
| criterion=gini |  | 0.486565936 |
| Perceptron | penalty='l1' | n\_iter=100 | 0.408157132 |
| penalty='l2' | n\_iter=100 | 0.424499451 |
| Linear SVC | penalty='l1' |  | 0.475014829 |
| penalty='l2' |  | 0.484434301 |
| Gaussian NB |  |  | 0.549260375 |
| Bagging Classifier | n\_estimators=5 |  | 0.583122097 |
| n\_estimators=10 |  | 0.59184294 |
| n\_estimators=15 |  | 0.603076451 |
| n\_estimators=25 |  | 0.559934365 |
| Random Forest | max\_depth=None |  | 0.544101222 |
| max\_depth=5 |  | 0.580327038 |
| max\_depth=10 |  | 0.020510983 |
| AdaBoost Classifier | n\_estimators=10 | learning\_rate=10 | 0.491165163 |
| learning\_rate=1 | 0.499520296 |
| learning\_rate=0.1 | 0.037136533 |
| n\_estimators=25 | learning\_rate=10 | 0.478412815 |
| learning\_rate=1 | 0.499520296 |
| learning\_rate=0.1 | 0.153470115 |
| n\_estimators=50 | learning\_rate=10 | 0.478412815 |
| learning\_rate=1 | 0.502758353 |
| learning\_rate=0.1 | 0.020511754 |
| Gradient Boosting | n\_estimators=50 | learning\_rate=1 | 0.593962268 |
| learning\_rate=0.1 | 0.523391058 |
| learning\_rate=0.01 | 0.020511754 |
| n\_estimators=100 | learning\_rate=1 | 0.61303351 |
| learning\_rate=0.1 | 0.534066055 |
| learning\_rate=0.01 | 0.020511754 |
| n\_estimators=150 | learning\_rate=1 | 0.623949251 |
| learning\_rate=0.1 | 0.546340709 |
| learning\_rate=0.01 | 0.6337909 |
| MLPClassifier | solver='sgd' | alpha=1e-5 | 0.703884211 |
| alpha=1e-4 | 0.649509456 |
| alpha=1e-3 | 0.695201467 |
| alpha=1e-2 | 0.626726907 |
| alpha=1e-1 | 0.713577232 |
| solver='adm' | alpha=1e-5 | 0.643425346 |
| alpha=1e-4 | 0.698963363 |
| alpha=1e-3 | 0.611042529 |
| alpha=1e-2 | 0.650856897 |
| LogisticRegression | penalty='l1' | solver='liblinear' | 0.499804153 |
| penalty='l2' | solver='newton-cg' | 0.499758463 |
| solver='lbfgs' | 0.498974563 |
| solver='liblinear' | 0.499568741 |
| solver='sag' | 0.499440344 |
| KNeighbors | n\_neighbors=1 | algorithm='auto' | 0.547580255 |
| algorithm='ball\_tree' | 0.571572863 |
| algorithm='kd\_tree' | 0.512795197 |
| algorithm='brute' | 0.548460582 |
| n\_neighbors=5 | algorithm='auto' | 0.57033244 |
| algorithm='ball\_tree' | 0.511794989 |
| algorithm='kd\_tree' | 0.547580255 |
| algorithm='brute' | 0.571572863 |
| n\_neighbors=10 | algorithm='auto' | 0.512354822 |
| algorithm='ball\_tree' | 0.547461327 |
| algorithm='kd\_tree' | 0.569174678 |

Method Comparison:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Method | Parameter1 | Parameter2 | Cross Validation | Accuracy | Precision | Recall | Fbeta |
| Decision Tree | criterion=entropy |  | 0.495993396 | 1 | 1 | 1 | 1 |
| Perceptron | penalty='l2' | n\_iter=100 | 0.424499451 | 0.389964 | 0.494868 | 0.729368 | 0.589659 |
| Linear SVC | penalty='l2' |  | 0.484434301 | 0.49952 | 0.49952 | 1 | 0.66624 |
| Gaussian NB |  |  | 0.550216337 | 0.952139 | 0.948405 | 0.975506 | 0.961765 |
| Bagging Classifier | n\_estimators=15 |  | 0.606116971 | 0.99888 | 0.998721 | 0.99984 | 0.99928 |
| Random Forest | max\_depth=5 |  | 0.580327038 | 0.702399 | 0.687436 | 0.912271 | 0.784053 |
| AdaBoost | n\_estimators=10 | learning\_rate=1 | 0.499520296 | 0.49952 | 0.49952 | 1 | 0.66624 |
| Gradient Boosting | n\_estimators=150 | learning\_rate=1 | 0.625229763 | 0.641663 | 0.651195 | 0.852397 | 0.738335 |
| MLPClassifier | solver='sgd' | alpha=1e-1 | 0.713577232 | 0.917393 | 0.973189 | 0.918114 | 0.944849 |
| MLPClassifier | solver='adm' | alpha=1e-4 | 0.698963363 | 0.985086 | 0.989456 | 0.999039 | 0.994225 |
| Logistic Regression | Penalty=’l1’ | Solver=’liblinear’ | 0.499440344 | 0.499521 | 0.499521 | 1 | 0.666240 |
| KNeighbors | n\_neighbors=1 | algorithm='auto' | 0.547580255 | 0.694162 | 0.702671 | 0.825342 | 0.759083 |