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CS 6375.003

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Collaborative Filtering

Mean Absolute Error (MAE) = 0.9096

Root Mean Squared Error (RMSE) = 1.995

SVM

|  |  |  |  |
| --- | --- | --- | --- |
| # | Parameters | Accuracy | Error Rate |
| 1 | kernel='linear', C=2.0 | 93.81 | 6.19 |
| 2 | kernel='linear', C=1.0 | 94.04 | 5.96 |
| 3 | kernel='poly', gamma='auto', max\_iter=5, degree=2 | 25.79 | 74.21 |
| 4 | kernel='rbf', C=5,decision\_function\_shape='ovo' | 98.41 | 1.59 |
| 5 | kernel='rbf', C=1, max\_iter=100 | 92.71 | 7.29 |
| 6 | C=0.9, kernel='poly', degree=3 | 97.68 | 2.32 |
| 7 | kernel='sigmoid', C=1, class\_weight='balanced' | 77.63 | 22.37 |
| 8 | C=100, kernel='linear', gamma='auto', max\_iter=1000, probability=False, random\_state=None | 80.14 | 19.86 |
| 9 | kernel='rbf', gamma='scale', random\_state=None | 97.92 | 2.08 |
| 10 | kernel='sigmoid', coef0=0.68,degree=15, random\_state=1 | 71.55 | 28.45 |

MLPC

|  |  |  |  |
| --- | --- | --- | --- |
| # | Parameters | Accuracy | Error Rate |
| 1 | solver='sgd', activation='logistic',alpha=1,learning\_rate\_init=.1,early\_stopping=True | 91.05 | 8.95 |
| 2 | activation = 'identity' | 92.41 | 7.59 |
| 3 | activation = 'logistic' | 97.84 | 2.16 |
| 4 | activation='relu', solver='adam',hidden\_layer\_sizes=(15,),random\_state=1 | 94.8 | 5.2 |
| 5 | solver='sgd', random\_state=1, batch\_size ='auto' | 97.3 | 2.7 |
| 6 | solver='adam', validation\_fraction=0.2, beta\_1=0.9, beta\_2=0.999 | 97.79 | 2.21 |
| 7 | solver='sgd', nesterovs\_momentum = False | 97.17 | 2.83 |
| 8 | solver='sgd', random\_state=2, batch\_size ='auto' | 97.06 | 2.94 |
| 9 | hidden\_layer\_sizes=(10, 5), max\_iter=500 | 93.21 | 6.79 |
| 10 | activation='relu',solver='lbfgs', hidden\_layer\_sizes=(10,10),random\_state=35, alpha=0.001,learning\_rate='constant',learning\_rate\_init = 0.7,shuffle=True, max\_iter = 100 | 85.56 | 14.44 |

KNN

|  |  |  |  |
| --- | --- | --- | --- |
| # | Parameters | Accuracy | Error Rate |
| 1 | n\_neighbors=6 | 96.77 | 3.23 |
| 2 | n\_neighbors=7, weights='distance' | 97 | 3 |
| 3 | n\_neighbors=6, weights='distance' | 97.09 | 2.91 |
| 4 | n\_neighbors=3,algorithm="kd\_tree",leaf\_size=30,weights='distance' | 97.17 | 2.83 |
| 5 | n\_neighbors=5,algorithm="kd\_tree",leaf\_size=30, weights='distance' | 96.91 | 3.09 |
| 6 | algorithm='brute', n\_jobs=5 | 96.88 | 3.12 |
| 7 | algorithm='brute', n\_jobs=10, weights='distance' | 96.91 | 3.09 |
| 8 | n\_neighbors=10,algorithm='brute', n\_jobs=10, weights='distance' | 96.84 | 3.16 |
| 9 | n\_neighbors=15,algorithm='brute', n\_jobs=10, weights='distance', leaf\_size=50 | 96.47 | 3.53 |
| 10 | n\_neighbors=2, weights='distance', algorithm='ball\_tree', n\_jobs=3 | 96.91 | 3.09 |

BEST ERROR RATE FOR EACH CLASSIFIER

|  |  |
| --- | --- |
| Classifier | Error Rate |
| SVM | 1.59 |
| MLPC | 2.16 |
| KNN | 2.91 |