5000 train:

Results for KNN:

Accuracy: 0.63

Precision: 0.630189072276968

Recall: 0.6298356701341775

F1 Score: 0.6234440212142381

Confusion Matrix:

[[57 1 0 0 1 0 0 0 0 3 0 1 1 3 0]

[ 0 62 4 0 0 0 0 1 0 0 0 0 0 0 0]

[ 0 16 37 11 0 0 1 0 0 0 1 0 0 1 0]

[ 0 3 19 39 0 4 0 0 0 0 0 0 0 1 0]

[ 5 0 0 1 43 2 1 2 1 2 0 2 0 1 7]

[ 1 0 6 11 3 33 2 1 2 2 0 3 1 1 0]

[ 2 4 0 2 0 0 44 3 3 3 0 0 2 3 0]

[ 1 0 2 1 2 7 4 37 0 4 0 0 1 1 7]

[ 0 1 2 0 2 1 3 0 57 0 0 0 0 0 0]

[ 2 0 0 1 8 3 9 8 2 24 0 0 0 1 8]

[ 3 4 1 0 0 1 1 0 1 0 45 0 11 0 0]

[ 6 0 0 0 4 3 3 4 0 2 0 34 0 9 2]

[ 0 3 1 1 0 1 3 5 3 0 18 0 32 0 0]

[ 1 0 0 0 5 0 2 2 2 2 1 4 1 47 0]

[ 1 0 3 0 6 0 3 6 5 4 0 0 0 0 39]]

Results for Decision Tree:

Accuracy: 0.4

Precision: 0.4050444193794172

Recall: 0.39986431478968787

F1 Score: 0.4005930562695644

Confusion Matrix:

[[34 2 0 3 5 2 2 2 0 3 1 5 3 3 2]

[ 1 52 5 1 0 1 0 1 2 0 1 0 1 2 0]

[ 1 6 29 15 0 3 5 2 0 1 0 1 3 1 0]

[ 0 1 7 37 1 3 1 4 3 5 0 2 1 1 0]

[ 4 0 2 1 26 5 1 4 1 3 3 3 1 6 7]

[ 0 0 3 10 3 17 2 3 1 4 1 16 1 4 1]

[ 0 1 1 4 4 2 24 4 2 10 3 2 3 0 6]

[ 0 1 2 2 1 4 3 26 2 5 2 2 5 4 8]

[ 0 1 1 5 2 1 3 4 33 3 2 3 1 0 7]

[ 4 0 1 3 5 6 3 7 2 12 1 2 2 7 11]

[ 2 1 3 1 1 3 2 2 1 2 27 3 14 3 2]

[ 8 0 1 1 5 10 1 4 0 2 1 18 3 9 4]

[ 2 0 4 1 5 5 4 2 0 2 10 1 27 1 3]

[ 6 1 0 2 7 1 2 4 3 7 1 13 3 16 1]

[ 0 1 1 4 6 3 4 6 8 8 0 0 2 2 22]]

Results for SGD:

Accuracy: 0.433

Precision: 0.4746234915120332

Recall: 0.4325192220714609

F1 Score: 0.44146044590791816

Confusion Matrix:

[[47 0 0 2 4 4 1 0 0 5 0 0 1 3 0]

[ 0 47 4 1 0 1 3 4 1 0 4 0 1 1 0]

[ 1 4 26 12 0 1 1 3 4 6 1 0 2 3 3]

[ 0 0 9 23 1 3 4 1 0 12 1 1 3 6 2]

[ 2 0 1 0 28 3 2 5 0 1 1 2 2 10 10]

[ 0 0 2 4 1 24 1 7 0 6 1 6 1 9 4]

[ 0 1 4 2 1 0 13 5 0 14 0 1 8 15 2]

[ 1 0 0 0 2 4 1 26 1 7 5 0 3 16 1]

[ 0 3 8 2 1 3 8 1 26 6 0 0 1 7 0]

[ 0 0 0 3 0 7 3 7 0 25 0 1 1 8 11]

[ 0 1 1 0 2 0 0 3 1 2 35 1 8 12 1]

[ 7 0 1 0 5 10 3 3 1 2 5 21 1 6 2]

[ 3 0 0 2 4 0 1 1 0 4 5 1 29 15 2]

[ 2 0 0 1 1 1 3 5 2 6 4 2 4 35 1]

[ 3 0 1 0 3 1 3 4 1 12 0 2 2 7 28]]

First 10000 train:

Results for KNN:

Accuracy: 0.715

Precision: 0.7156083080606354

Recall: 0.7151515151515152

F1 Score: 0.7101744109167117

Confusion Matrix:

[[60 0 0 0 1 0 1 0 0 2 0 1 1 0 0]

[ 0 65 1 0 0 0 0 0 0 0 0 0 0 0 0]

[ 0 10 47 6 0 2 0 0 0 1 0 0 1 0 0]

[ 0 3 11 46 1 4 0 0 0 0 0 1 1 0 0]

[ 3 0 0 2 49 0 1 1 3 1 0 2 0 4 1]

[ 2 0 5 6 0 44 0 1 1 3 0 2 1 1 0]

[ 0 5 0 1 0 1 52 2 2 2 1 0 0 1 0]

[ 1 0 0 2 2 3 6 41 0 8 0 0 0 1 3]

[ 0 0 0 0 0 1 1 0 64 0 0 0 1 0 0]

[ 2 0 0 1 2 1 4 8 5 36 0 0 0 1 7]

[ 1 3 1 0 0 0 1 0 1 0 50 0 10 0 0]

[ 6 1 1 0 5 1 0 2 0 1 0 40 0 9 0]

[ 2 2 2 0 0 0 2 1 0 0 16 0 41 1 0]

[ 2 0 0 0 1 1 3 0 4 3 0 10 0 43 0]

[ 0 0 2 1 1 0 3 5 9 8 0 0 0 0 37]]

Results for Decision Tree:

Accuracy: 0.473

Precision: 0.48088992238635325

Recall: 0.4734207749133122

F1 Score: 0.47603191985642707

Confusion Matrix:

[[45 1 0 1 1 2 2 0 0 1 3 8 0 2 0]

[ 0 53 3 2 1 0 0 1 0 0 2 0 2 2 0]

[ 0 2 38 11 0 3 1 1 1 1 2 1 3 1 2]

[ 0 1 10 34 1 7 2 2 2 3 2 0 0 1 2]

[ 4 0 1 1 31 2 5 2 1 2 1 6 1 3 7]

[ 1 0 0 3 3 30 1 1 0 8 0 9 4 3 3]

[ 1 0 1 0 3 1 27 8 3 4 3 1 5 7 3]

[ 1 1 3 1 5 9 7 19 1 9 1 1 1 0 8]

[ 0 2 2 1 3 0 5 8 37 1 0 3 2 2 1]

[ 0 0 1 3 1 8 7 8 0 19 4 3 0 1 12]

[ 3 1 1 0 1 2 1 2 2 0 35 1 13 4 1]

[ 4 1 1 0 3 2 5 5 0 1 1 31 4 8 0]

[ 3 1 1 3 2 1 1 5 0 0 16 2 26 4 2]

[ 0 1 2 1 5 2 3 5 3 6 4 8 1 23 3]

[ 0 0 4 0 5 2 6 9 3 6 0 0 2 4 25]]

Results for SGD:

Accuracy: 0.431

Precision: 0.4873164976126742

Recall: 0.4312829790441731

F1 Score: 0.44349635643421265

Confusion Matrix:

[[49 0 0 2 0 0 0 0 0 4 1 5 2 2 1]

[ 0 50 5 2 3 0 0 1 0 1 0 0 2 2 0]

[ 1 3 23 4 4 1 6 3 1 15 4 0 1 1 0]

[ 0 1 2 26 0 2 5 2 0 10 0 0 8 9 2]

[ 1 0 1 0 33 2 0 6 1 7 1 2 2 8 3]

[ 3 0 0 0 2 27 0 3 2 15 2 2 2 4 4]

[ 0 0 2 1 0 0 21 5 2 20 1 0 2 12 1]

[ 1 0 0 1 0 1 1 19 4 16 2 2 3 10 7]

[ 0 7 7 0 0 1 7 1 29 10 0 2 0 2 1]

[ 2 0 1 0 1 4 2 4 0 31 2 4 2 6 8]

[ 2 1 1 1 2 0 5 2 5 3 25 2 5 13 0]

[ 5 0 0 0 2 8 0 6 0 6 3 13 7 16 0]

[ 2 0 0 2 2 0 2 2 0 13 9 1 26 6 2]

[ 0 0 1 0 2 0 2 5 1 9 1 7 1 37 1]

[ 0 1 0 0 3 2 2 8 1 22 0 2 0 3 22]]

Second 10000 train:

Results for KNN:

Accuracy: 0.693

Precision: 0.6928572695833234

Recall: 0.6929142167948138

F1 Score: 0.6876595265828788

Confusion Matrix:

[[62 0 0 0 2 0 0 0 1 1 0 1 0 0 0]

[ 0 63 3 0 1 0 0 0 0 0 0 0 0 0 0]

[ 0 13 50 4 0 0 0 0 0 0 0 0 0 0 0]

[ 1 5 19 33 0 6 1 0 0 0 0 0 0 1 0]

[ 1 0 0 0 47 1 3 3 1 3 0 2 0 2 4]

[ 0 1 7 10 0 42 0 2 0 0 0 4 0 1 0]

[ 0 5 0 0 3 0 44 2 3 5 0 0 1 2 1]

[ 1 1 1 2 3 3 7 39 2 6 0 0 0 0 2]

[ 0 0 1 0 1 0 1 0 62 0 0 0 0 0 1]

[ 3 0 0 2 7 1 8 7 6 26 0 0 0 1 6]

[ 1 2 0 0 0 0 1 0 0 0 52 0 10 1 0]

[ 1 0 0 0 3 1 1 1 0 4 0 43 0 10 2]

[ 1 0 0 1 0 1 5 0 0 0 16 0 43 0 0]

[ 3 0 0 0 4 0 2 4 2 1 1 4 0 46 0]

[ 1 0 0 0 6 1 0 9 2 6 0 0 0 0 41]]

Results for Decision Tree:

Accuracy: 0.45

Precision: 0.45851118653483325

Recall: 0.4498869289914066

F1 Score: 0.4523754803154629

Confusion Matrix:

[[34 0 0 0 5 5 2 1 0 8 2 2 3 4 1]

[ 0 46 9 3 0 0 2 0 1 2 1 0 2 1 0]

[ 0 5 30 13 2 0 1 6 4 1 1 0 2 1 1]

[ 2 0 14 25 2 12 3 1 1 2 0 1 0 1 2]

[ 2 1 1 0 27 2 4 2 1 2 1 5 6 4 9]

[ 1 0 3 5 5 36 1 4 0 4 1 3 0 2 2]

[ 2 4 4 4 1 2 19 4 2 4 4 2 3 4 7]

[ 2 0 2 5 3 7 7 19 2 7 2 0 3 2 6]

[ 1 0 2 1 3 0 4 5 42 0 0 1 0 1 6]

[ 3 0 2 5 3 4 2 9 4 16 1 3 0 5 10]

[ 2 1 3 0 0 2 6 2 0 0 35 3 11 2 0]

[ 2 0 1 3 7 6 2 3 2 7 2 22 1 7 1]

[ 1 0 2 3 2 3 4 2 1 1 11 2 33 1 1]

[ 3 0 2 1 6 1 5 0 1 6 1 6 0 33 2]

[ 2 0 0 1 2 1 5 9 1 10 0 1 0 1 33]]

Results for SGD:

Accuracy: 0.38

Precision: 0.44561999972885236

Recall: 0.37958691391527216

F1 Score: 0.39459962112545793

Confusion Matrix:

[[41 0 0 2 2 0 0 4 0 4 0 6 5 3 0]

[ 0 45 6 1 2 0 1 6 3 0 0 0 1 1 1]

[ 0 7 9 7 2 1 0 21 1 8 2 1 3 3 2]

[ 0 1 4 21 1 1 8 11 0 7 0 1 3 3 5]

[ 3 0 0 0 29 0 1 9 0 1 3 2 5 5 9]

[ 0 0 0 5 2 27 0 16 0 9 0 2 1 4 1]

[ 0 1 0 3 4 0 8 26 2 3 0 1 4 14 0]

[ 1 0 3 0 5 2 1 32 3 5 5 1 2 5 2]

[ 0 1 5 3 2 2 5 6 29 4 0 0 0 6 3]

[ 1 0 1 2 2 5 3 10 0 18 1 4 3 8 9]

[ 0 2 0 0 4 0 2 12 0 0 31 0 8 8 0]

[ 2 0 0 1 5 4 1 13 0 5 3 17 3 10 2]

[ 0 0 0 0 2 0 3 11 0 6 11 1 25 4 4]

[ 0 0 0 4 3 0 1 19 0 3 0 8 3 25 1]

[ 0 0 0 0 5 1 3 14 0 10 0 1 4 5 23]]

Third 10000 train:

Results for KNN:

Accuracy: 0.695

Precision: 0.692034080343081

Recall: 0.6956429971355345

F1 Score: 0.6862710949308529

Confusion Matrix:

[[59 1 1 0 0 0 1 0 1 2 0 0 1 1 0]

[ 0 64 1 0 0 0 1 0 0 0 0 0 0 0 0]

[ 0 14 44 8 0 0 0 0 0 0 0 0 0 0 0]

[ 0 3 18 39 0 3 1 0 0 0 0 1 2 0 0]

[ 2 0 0 0 61 0 0 0 0 2 0 1 0 0 0]

[ 0 0 7 8 3 36 1 4 3 2 0 1 1 1 0]

[ 0 4 3 1 1 0 51 1 1 0 0 0 1 3 0]

[ 1 0 4 3 4 2 4 34 2 6 2 1 1 0 3]

[ 0 0 0 0 0 0 0 0 66 1 0 0 0 0 0]

[ 1 0 1 1 4 6 7 4 1 28 0 3 0 0 11]

[ 0 2 0 0 0 0 3 1 0 0 52 0 8 0 0]

[ 4 0 0 0 6 7 2 0 0 2 0 34 0 11 1]

[ 4 0 1 0 1 0 3 0 0 0 17 1 39 1 0]

[ 1 0 0 0 4 1 3 0 5 0 0 7 0 45 1]

[ 0 0 0 0 5 0 2 7 3 7 0 0 0 0 43]]

Results for Decision Tree:

Accuracy: 0.454

Precision: 0.4570920008425406

Recall: 0.454213779586914

F1 Score: 0.4544480616698296

Confusion Matrix:

[[45 0 0 2 1 1 1 2 0 6 1 5 1 2 0]

[ 1 51 6 2 0 0 0 0 2 0 3 0 1 0 0]

[ 2 8 24 10 1 3 3 8 1 3 2 0 0 0 1]

[ 0 0 10 32 0 4 1 5 0 5 0 1 4 2 3]

[ 4 1 1 0 31 2 1 5 2 3 0 5 2 2 7]

[ 1 1 2 12 5 22 0 5 1 4 0 7 1 2 4]

[ 2 1 2 4 3 2 19 7 3 1 3 3 5 4 7]

[ 1 0 4 6 4 2 5 21 6 6 6 0 0 4 2]

[ 0 3 2 2 2 1 0 1 42 3 0 0 2 3 6]

[ 3 0 0 4 1 8 8 5 2 19 4 0 1 3 9]

[ 1 0 0 0 0 2 4 5 0 3 39 1 9 2 0]

[ 4 0 0 0 4 9 1 0 1 6 2 27 0 8 5]

[ 3 0 2 2 2 3 2 4 0 5 12 2 28 1 1]

[ 1 0 0 0 6 3 8 2 1 5 2 9 3 25 2]

[ 1 0 0 1 4 2 2 4 3 9 0 4 3 5 29]]

Results for SGD:

Accuracy: 0.394

Precision: 0.4297140296013845

Recall: 0.39412030755314337

F1 Score: 0.40274437981184

Confusion Matrix:

[[46 0 0 0 0 1 2 0 0 7 0 9 0 1 1]

[ 0 46 5 2 1 0 2 1 6 0 2 0 0 0 1]

[ 0 9 17 6 2 2 3 7 4 3 2 1 1 3 6]

[ 0 1 3 19 0 5 6 6 0 11 1 3 2 4 6]

[ 5 0 0 1 31 2 1 13 0 1 2 3 0 3 4]

[ 1 0 0 4 1 19 2 5 1 11 3 11 3 4 2]

[ 1 1 2 2 3 0 22 10 2 8 1 5 3 4 2]

[ 0 1 0 0 0 2 4 26 6 9 3 5 1 4 6]

[ 0 3 5 3 1 0 4 6 30 8 0 1 0 4 2]

[ 0 0 1 3 2 5 6 10 1 20 1 6 3 4 5]

[ 1 3 1 0 0 2 3 13 0 0 22 3 7 9 2]

[ 3 0 0 1 2 7 3 5 1 1 4 21 6 10 3]

[ 3 0 0 0 5 1 8 7 0 5 2 4 22 8 2]

[ 1 0 0 1 4 1 1 7 3 9 1 10 4 25 0]

[ 0 0 1 1 5 3 3 7 0 13 0 2 2 2 28]]