Results for KNN:

Accuracy: 0.336

Precision: 0.513676354770231

Recall: 0.33532338308457715

F1 Score: 0.3410781601513749

Confusion Matrix:

[[39 10 1 0 2 1 4 0 1 0 1 2 0 6 0]

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

[ 0 33 29 4 0 1 0 0 0 0 0 0 0 0 0]

[ 0 33 18 15 0 0 0 0 0 0 0 0 0 0 0]

[ 1 34 9 4 13 2 1 0 0 0 1 0 0 1 0]

[ 0 10 33 16 0 5 0 0 0 1 2 0 0 0 0]

[ 1 48 3 1 0 0 11 0 2 0 1 0 0 0 0]

[ 0 35 6 0 0 3 0 13 1 1 5 0 2 0 0]

[ 0 6 1 0 0 2 1 0 54 0 1 1 1 0 0]

[ 0 23 0 1 1 4 11 4 0 13 5 0 0 5 0]

[ 0 25 0 0 0 1 0 0 0 0 33 0 8 0 0]

[ 0 15 16 2 4 2 4 0 1 0 5 11 0 5 1]

[ 0 22 4 4 0 0 1 2 0 0 19 0 14 0 0]

[ 1 29 4 0 0 4 10 1 1 0 0 1 1 15 0]

[ 0 19 9 1 5 11 2 2 1 5 3 0 0 0 9]]

Results for Decision Tree:

Accuracy: 0.275

Precision: 0.27174872346467344

Recall: 0.27474747474747474

F1 Score: 0.27213299839195154

Confusion Matrix:

[[29 0 0 1 3 2 4 3 0 5 3 8 4 2 3]

[ 0 44 11 6 0 0 1 1 2 0 2 0 0 0 0]

[ 0 9 22 16 2 2 2 3 4 0 1 2 3 1 0]

[ 1 3 10 16 2 3 8 5 4 4 1 3 0 3 3]

[ 1 1 3 6 15 7 5 7 6 4 0 1 3 4 3]

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

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

[ 2 0 1 5 1 2 6 13 4 4 8 4 6 3 7]

[ 0 6 11 5 1 1 1 4 23 2 4 1 2 2 4]

[ 4 2 2 0 2 7 5 5 5 11 5 2 5 4 8]

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

[11 0 0 1 8 3 5 2 0 0 2 15 7 9 3]

[ 4 0 1 2 1 3 4 3 4 4 16 4 15 3 2]

[ 6 1 0 3 7 6 3 3 6 7 3 2 5 14 1]

[ 6 2 5 5 3 5 11 4 3 4 2 3 1 3 10]]

Results for SGD:

Accuracy: 0.394

Precision: 0.39803154551803005

Recall: 0.3938037087290818

F1 Score: 0.3890802710864953

Confusion Matrix:

[[46 0 0 1 4 2 1 2 0 0 1 2 7 1 0]

[ 0 50 4 3 0 0 1 0 2 0 4 0 2 1 0]

[ 0 9 26 14 1 1 1 1 5 0 1 0 5 1 2]

[ 0 2 10 28 2 2 1 0 3 1 2 4 9 1 1]

[ 2 0 1 0 29 3 4 2 2 2 3 3 4 4 7]

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

[ 0 6 3 5 2 1 14 3 7 0 4 1 11 8 2]

[ 0 1 5 0 2 2 5 17 2 5 3 3 7 9 5]

[ 0 10 5 2 0 0 8 2 32 2 1 1 1 1 2]

[ 1 0 2 0 0 8 6 7 1 16 2 2 2 11 9]

[ 2 6 0 1 0 0 1 4 2 0 28 1 19 2 1]

[ 7 1 0 1 7 9 3 4 1 1 4 14 7 7 0]

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

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

[ 3 1 5 2 4 0 6 7 8 2 1 1 7 4 16]]

二：

Results for KNN:

Accuracy: 0.425

Precision: 0.5923865240359977

Recall: 0.4246193276044022

F1 Score: 0.4380533209544781

Confusion Matrix:

[[44 3 4 1 1 2 2 1 1 0 5 1 0 1 0]

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

[ 0 29 34 4 0 0 0 0 0 0 0 0 0 0 0]

[ 0 28 17 22 0 0 0 0 0 0 0 0 0 0 0]

[ 2 29 8 6 19 2 1 0 0 0 0 0 0 0 0]

[ 0 11 31 11 0 10 1 0 0 1 0 0 0 2 0]

[ 0 40 4 1 0 0 18 0 2 0 0 0 1 0 0]

[ 0 23 3 3 0 2 3 21 0 0 10 0 1 0 1]

[ 0 5 1 0 0 1 1 0 58 0 0 0 1 0 0]

[ 1 30 1 1 0 1 5 3 0 20 0 0 0 5 0]

[ 0 14 1 0 0 0 0 1 0 0 41 0 10 0 0]

[ 0 15 5 4 6 1 6 2 1 0 1 18 0 7 0]

[ 0 11 4 2 0 0 1 1 0 0 26 0 21 0 0]

[ 0 29 1 1 1 0 4 1 0 3 3 1 1 22 0]

[ 0 20 4 4 5 5 2 3 2 6 1 0 0 0 14]]

Results for Decision Tree:

Accuracy: 0.328

Precision: 0.3187689563996071

Recall: 0.3278456203829338

F1 Score: 0.32110023107691915

Confusion Matrix:

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

[ 0 52 9 1 0 0 2 0 2 0 1 0 0 0 0]

[ 0 5 32 7 3 2 6 2 2 1 1 1 2 2 1]

[ 2 3 7 22 3 4 6 6 2 3 2 3 1 2 1]

[ 5 1 5 1 18 9 1 1 3 2 1 5 5 4 6]

[ 2 1 2 6 3 12 6 4 5 9 1 11 2 2 1]

[ 2 2 3 4 3 1 16 5 2 8 3 2 4 6 5]

[ 4 4 3 4 0 7 4 17 4 8 1 2 3 3 3]

[ 3 11 4 5 1 2 5 1 21 3 5 1 0 4 1]

[ 4 0 1 5 3 4 5 8 3 16 2 4 3 2 7]

[ 1 2 1 1 2 0 1 1 3 2 31 2 15 3 2]

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

[ 2 0 0 2 2 0 3 3 2 7 12 4 22 5 2]

[ 3 3 2 5 6 5 6 5 1 8 4 4 3 9 3]

[ 1 2 5 3 8 4 8 3 4 8 2 1 4 2 11]]

Results for SGD:

Accuracy: 0.41

Precision: 0.4342521735017343

Recall: 0.40976933514246944

F1 Score: 0.40637245988373877

Confusion Matrix:

[[41 0 0 5 2 1 2 0 0 2 0 8 3 2 0]

[ 0 57 3 4 1 0 1 0 1 0 0 0 0 0 0]

[ 0 8 30 15 3 2 2 0 3 0 0 0 2 0 2]

[ 0 3 14 27 2 2 2 1 1 1 2 3 6 2 1]

[ 2 1 2 3 40 3 1 0 0 5 1 3 3 0 3]

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

[ 0 3 4 4 1 1 16 3 4 8 0 5 12 3 2]

[ 0 1 1 3 2 12 2 18 1 10 2 6 1 2 6]

[ 1 11 4 1 1 2 3 2 27 2 1 1 7 2 2]

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

[ 2 5 2 0 1 2 0 3 0 1 26 3 22 0 0]

[ 3 1 3 6 3 16 2 3 1 1 1 13 10 2 1]

[ 1 0 1 3 2 6 3 0 0 3 10 3 32 1 1]

[ 3 1 4 5 3 5 4 0 1 4 1 12 10 12 2]

[ 0 0 1 3 6 5 3 7 2 11 0 2 8 0 18]]

三：

Results for KNN:

Accuracy: 0.412

Precision: 0.5896300508409132

Recall: 0.4118046132971506

F1 Score: 0.42034127748511785

Confusion Matrix:

[[55 3 0 0 1 0 1 2 0 1 0 0 0 3 0]

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

[ 0 31 29 7 0 0 0 0 0 0 0 0 0 0 0]

[ 0 25 18 24 0 0 0 0 0 0 0 0 0 0 0]

[ 0 32 8 5 16 2 1 0 0 0 0 0 0 2 0]

[ 0 16 35 5 0 9 0 0 0 0 1 0 0 0 0]

[ 0 38 0 0 0 0 27 0 0 0 0 0 1 0 0]

[ 0 23 4 0 0 1 6 19 0 1 11 0 2 0 0]

[ 0 6 0 1 0 2 1 0 56 0 1 0 0 0 0]

[ 1 20 3 2 1 2 10 4 3 15 3 0 0 2 1]

[ 0 21 0 0 0 0 0 0 0 0 34 0 12 0 0]

[ 3 11 10 3 8 1 2 4 2 1 4 11 3 4 0]

[ 0 24 3 0 0 0 1 0 0 0 16 0 23 0 0]

[ 2 29 1 0 2 0 9 0 3 2 3 0 0 16 0]

[ 0 20 6 5 1 4 5 5 1 1 1 0 0 1 16]]

Results for Decision Tree:

Accuracy: 0.294

Precision: 0.290861982120401

Recall: 0.29377355646012365

F1 Score: 0.29117611832150253

Confusion Matrix:

[[23 0 0 3 3 3 5 1 1 4 0 7 4 8 4]

[ 0 55 6 0 0 0 1 0 1 0 1 2 0 1 0]

[ 0 9 22 10 2 2 3 1 7 3 1 3 0 2 2]

[ 2 1 4 16 1 8 3 3 3 2 6 3 6 5 4]

[ 4 2 3 4 15 5 2 5 2 4 5 5 3 4 3]

[ 4 0 4 9 1 15 2 7 3 3 2 5 1 3 7]

[ 1 1 4 4 2 2 16 7 0 9 3 3 4 4 6]

[ 1 2 4 6 1 6 6 12 3 8 3 0 4 4 7]

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

[ 4 1 3 5 4 6 6 5 5 7 2 5 4 2 8]

[ 1 2 2 1 0 3 4 1 2 1 27 2 19 2 0]

[ 5 1 2 2 6 7 3 4 2 2 5 16 5 6 1]

[ 5 1 5 4 0 3 4 4 1 1 9 2 20 5 3]

[ 5 0 2 1 7 8 3 5 2 7 2 7 1 11 6]

[ 2 0 5 1 6 3 7 4 4 10 4 3 3 1 13]]

Results for SGD:

Accuracy: 0.441

Precision: 0.4431917896565555

Recall: 0.44126338006935023

F1 Score: 0.4346733234516518

Confusion Matrix:

[[48 0 1 0 0 1 1 1 0 1 0 9 3 1 0]

[ 0 59 3 1 3 0 1 0 0 0 0 0 0 0 0]

[ 0 7 25 7 0 6 2 6 3 1 2 1 0 1 6]

[ 0 4 17 19 0 5 5 3 2 1 1 2 3 2 3]

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

[ 1 2 0 2 6 40 0 2 3 0 4 3 0 0 3]

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

[ 3 2 2 0 1 7 2 23 1 8 0 6 2 4 6]

[ 0 6 6 0 0 0 6 3 38 2 0 1 0 1 4]

[ 3 0 0 1 5 11 0 9 3 16 1 4 2 4 8]

[ 0 8 1 1 0 1 3 5 0 0 34 2 9 3 0]

[ 8 0 0 0 6 10 0 4 2 2 5 20 3 5 2]

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

[ 1 0 1 0 2 6 3 2 1 5 2 19 4 18 3]

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

四：

Results for KNN:

Accuracy: 0.406

Precision: 0.5877207325391985

Recall: 0.4059701492537313

F1 Score: 0.42243190469703973

Confusion Matrix:

[[41 11 2 1 1 1 2 1 0 0 3 0 1 3 0]

[ 0 65 2 0 0 0 0 0 0 0 0 0 0 0 0]

[ 0 32 26 9 0 0 0 0 0 0 0 0 0 0 0]

[ 0 24 20 23 0 0 0 0 0 0 0 0 0 0 0]

[ 2 34 7 3 19 1 1 0 0 0 0 0 0 0 0]

[ 0 8 29 11 0 14 0 1 0 2 1 0 0 0 0]

[ 1 47 4 0 0 0 13 0 1 0 0 0 0 1 0]

[ 0 22 3 1 0 1 3 24 0 2 8 0 2 0 0]

[ 0 8 1 0 0 1 0 0 55 0 1 0 0 0 0]

[ 2 24 0 0 1 3 8 4 1 16 5 0 1 2 0]

[ 0 16 0 0 0 0 1 1 0 0 38 0 11 0 0]

[ 1 12 6 5 5 3 4 2 0 3 7 13 0 6 0]

[ 0 19 2 1 0 0 3 0 0 0 20 0 21 0 0]

[ 2 28 1 1 1 2 10 0 1 1 1 0 0 18 0]

[ 0 23 4 5 0 3 1 3 3 3 0 1 1 0 20]]

Results for Decision Tree:

Accuracy: 0.322

Precision: 0.3184701085535369

Recall: 0.32166440524649487

F1 Score: 0.3190569166897858

Confusion Matrix:

[[38 0 1 2 3 4 2 1 0 0 0 5 7 2 2]

[ 0 51 8 0 0 1 0 1 3 1 1 0 0 1 0]

[ 1 8 16 9 2 3 5 6 7 3 0 0 3 2 2]

[ 3 1 7 23 2 7 4 2 3 2 1 2 5 1 4]

[ 6 3 1 6 19 7 0 4 0 6 0 6 3 3 3]

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

[ 1 1 7 3 2 3 16 5 6 3 4 1 6 7 2]

[ 0 0 3 2 3 5 7 16 6 4 7 4 2 4 3]

[ 0 6 5 3 1 2 7 4 23 1 3 0 3 5 3]

[ 2 0 4 2 3 2 12 6 4 15 1 7 3 1 5]

[ 1 1 4 2 1 1 7 1 2 2 28 2 7 8 0]

[ 8 1 1 4 7 7 3 4 2 3 2 15 2 6 2]

[ 1 1 6 5 4 1 4 7 1 2 11 6 13 2 2]

[ 4 1 1 4 3 10 2 3 5 6 3 7 2 13 2]

[ 2 1 5 3 10 4 3 4 6 5 1 0 4 2 17]]

Results for SGD:

Accuracy: 0.429

Precision: 0.42490361589134484

Recall: 0.42882556912407666

F1 Score: 0.42370558919494505

Confusion Matrix:

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

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

[ 0 16 22 9 1 4 1 0 1 3 1 1 4 1 3]

[ 0 2 16 25 1 5 1 1 0 1 1 1 5 6 2]

[ 2 0 0 1 35 0 2 1 1 0 6 6 2 2 9]

[ 2 0 5 2 2 31 0 2 1 5 3 11 1 1 0]

[ 0 6 1 2 2 3 18 2 7 4 3 2 5 6 6]

[ 2 2 6 0 2 3 4 20 4 6 2 0 2 6 7]

[ 0 7 2 0 2 1 5 3 36 2 0 4 0 1 3]

[ 3 0 0 1 3 4 6 2 2 24 2 5 4 6 5]

[ 3 3 2 0 1 0 3 1 0 0 31 0 13 9 1]

[ 6 0 1 0 7 10 0 8 2 5 1 18 6 2 1]

[ 2 0 4 1 1 5 6 3 1 0 15 2 26 0 0]

[ 5 0 0 2 3 3 4 4 3 7 4 9 3 17 2]

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