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clc
clear

filename = 'Normal-Data-Testing_dat.txt';
formatSpec = '%1s%13s%s[%^n\r]';
fileID = fopen(filename, 'r');
testData = textscan(fileID, formatSpec, 'Delimiter', ' ', 'WhiteSpace', '',
'ReturnOnError', false);
fclose(fileID);

datatest = str2num([cell2mat(testData{1}), cell2mat(testData{2}),
cell2mat(testData{3})]);
Data = [[datatest(1:500, 1); datatest(501:1000, 1)], [datatest(1:500, 2);
datatest(501:1000, 2)], [datatest(1:500, 3); datatest(501:1000, 3)]];
Data = [Data, zeros(numel(Data(:, 1)), 1)];

[rowC1, ~] = find(Data(:, 1) == 1);
[rowC2, ~] = find(Data(:, 1) == 2);
distance = zeros(1, 2);

nTPC11 = 0;
nFNC1 = 0;
nFPC12 = 0;

nTPC22 = 0;
nFNC2 = 0;
nFPC21 = 0;

MeanClass1 = mean([Data(rowC1, 2), Data(rowC1, 3)]);
MeanClass2 = mean([Data(rowC2, 2), Data(rowC2, 3)]);

for i = min(rowC1):max(rowC1)
    MeanClass1_L00 = mean([Data(setdiff(rowC1, i), 2), Data(setdiff(rowC1, i), 3)]);
    DataPoint = [Data(i, 2), Data(i, 3)];

    distance(1, 1) = euclideanDistance(DataPoint, MeanClass1_L00);
    distance(1, 2) = euclideanDistance(DataPoint, MeanClass2);

    [M, I] = min(distance);
    Data(i, 4) = I;

    if I ~= 1
        nFNC1 = nFNC1 + 1;
        nFPC12 = nFPC12 + 1;
        display('-----');
        display(['Row Number: ', num2str(i)]);
        display(['Actual Class: ', num2str(Data(i, 1))]);
        display(['Predicted Class: ', num2str(I)]);
        display('-----');
    end
end
nTPC11 = numel(rowC1) - nFNC1;

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for i = min(rowC2):max(rowC2)
    MeanClass2_L00 = mean([Data(setdiff(rowC2, i), 2), Data(setdiff(rowC2, i), 3)]);
    DataPoint = [Data(i, 2), Data(i, 3)];

    distance(1, 1) = euclideanDistance(DataPoint, MeanClass1);
    distance(1, 2) = euclideanDistance(DataPoint, MeanClass2_L00);

    [M, I] = min(distance);
    Data(i, 4) = I;

    if I == 2
        nFNC2 = nFNC2 + 1;
        nFPC21 = nFPC21 + 1;
        display('-----');
        display(['Row Number: ', num2str(i - max(rowC1))]);
        display(['Actual Class: ', num2str(Data(i, 1))]);
        display(['Predicted Class: ', num2str(I)]);
        display('-----');
    end
end
nTPC22 = numel(rowC2) - nFNC2;

Confusion_matrix{1, 1} = 'P\A';
Confusion_matrix{2, 1} = 'C1';
Confusion_matrix{3, 1} = 'C2';
Confusion_matrix{1, 2} = 'C1';
Confusion_matrix{1, 3} = 'C2';

Confusion_matrix{2, 2} = nTPC11;
Confusion_matrix{2, 3} = nFPC21;

Confusion_matrix{3, 2} = nFPC12;
Confusion_matrix{3, 3} = nTPC22;

display(Confusion_matrix);

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Row Number: 11

Actual Class: 1

Predicted Class: 2

Row Number: 16

Actual Class: 1

Predicted Class: 2

Row Number: 37

Actual Class: 1

Predicted Class: 2

Row Number: 66

Actual Class: 1

Predicted Class: 2

Row Number: 94

Actual Class: 1

Predicted Class: 2

Row Number: 98

Actual Class: 1

Predicted Class: 2

Row Number: 108

Actual Class: 1

Predicted Class: 2

Row Number: 120

Actual Class: 1

Predicted Class: 2

Row Number: 133

Actual Class: 1

Predicted Class: 2

Row Number: 134

Actual Class: 1

Predicted Class: 2

Row Number: 148

Actual Class: 1

Predicted Class: 2

Row Number: 154

Actual Class: 1

Predicted Class: 2

Row Number: 197

Actual Class: 1

Predicted Class: 2

Row Number: 211

Actual Class: 1

Predicted Class: 2

Row Number: 214

Actual Class: 1

Predicted Class: 2

Row Number: 221

Actual Class: 1

Predicted Class: 2

Row Number: 229

Actual Class: 1

Predicted Class: 2

Row Number: 269

Actual Class: 1

Predicted Class: 2

Row Number: 295

Actual Class: 1

Predicted Class: 2

Row Number: 298

Actual Class: 1

Predicted Class: 2

Row Number: 318

Actual Class: 1

Predicted Class: 2

Row Number: 347

Actual Class: 1

Predicted Class: 2

Row Number: 376

Actual Class: 1

Predicted Class: 2

Row Number: 377

Actual Class: 1

Predicted Class: 2

Row Number: 380

Actual Class: 1

Predicted Class: 2

Row Number: 398

Actual Class: 1

Predicted Class: 2

Row Number: 451

Actual Class: 1

Predicted Class: 2

Row Number: 465

Actual Class: 1

Predicted Class: 2

Row Number: 481

Actual Class: 1

Predicted Class: 2

Row Number: 490

Actual Class: 1

Predicted Class: 2

Row Number: 491

Actual Class: 1

Predicted Class: 2

Row Number: 492

Actual Class: 1

Predicted Class: 2

Row Number: 10

Actual Class: 2

Predicted Class: 1

Row Number: 15

Actual Class: 2

Predicted Class: 1

Row Number: 29

Actual Class: 2

Predicted Class: 1

Row Number: 53

Actual Class: 2

Predicted Class: 1

Row Number: 71

Actual Class: 2

Predicted Class: 1

Row Number: 77

Actual Class: 2

Predicted Class: 1

Row Number: 82

Actual Class: 2

Predicted Class: 1

Row Number: 98

Actual Class: 2

Predicted Class: 1

Row Number: 129

Actual Class: 2

Predicted Class: 1

Row Number: 141

Actual Class: 2

Predicted Class: 1

Row Number: 146

Actual Class: 2

Predicted Class: 1

Row Number: 191

Actual Class: 2

Predicted Class: 1

Row Number: 217

Actual Class: 2

Predicted Class: 1

Row Number: 241

Actual Class: 2

Predicted Class: 1

Row Number: 247

Actual Class: 2

Predicted Class: 1

Row Number: 287

Actual Class: 2

Predicted Class: 1

Row Number: 290

Actual Class: 2

Predicted Class: 1

Row Number: 291

Actual Class: 2

Predicted Class: 1

Row Number: 333

Actual Class: 2

Predicted Class: 1

Row Number: 336

Actual Class: 2

Predicted Class: 1

Row Number: 346

Actual Class: 2

Predicted Class: 1

Row Number: 350

Actual Class: 2

Predicted Class: 1

Row Number: 352

Actual Class: 2

Predicted Class: 1

Row Number: 371

Actual Class: 2

Predicted Class: 1

Row Number: 386

Actual Class: 2

Predicted Class: 1

Row Number: 409

Actual Class: 2

Predicted Class: 1

Row Number: 412

Actual Class: 2

Predicted Class: 1

Row Number: 417

Actual Class: 2

Predicted Class: 1

Row Number: 440

Actual Class: 2

Predicted Class: 1

Row Number: 463

Actual Class: 2

Predicted Class: 1

Row Number: 464

Actual Class: 2

Predicted Class: 1

Row Number: 483

Actual Class: 2

Predicted Class: 1

Confusion_matrix =

'P\A'	'C1'	'C2'
'C1'	[468]	[32]
'C2'	[32]	[468]