ML – Zadaca 4

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Podaci.cs:

public class StudentsData

{

[LoadColumn(1)]

public float P104 {get;set;}

[LoadColumn(2)]

public float P12 { get; set; }

[LoadColumn(3)]

public float P140 { get; set; }

[LoadColumn(4)]

public float P141 { get; set; }

[LoadColumn(5)]

public float P142 { get; set; }

[LoadColumn(6)]

public float P143 { get; set; }

[LoadColumn(7)]

public float P145 { get; set; }

[LoadColumn(8)]

public float P146 { get; set; }

[LoadColumn(9)]

public float P147 { get; set; }

[LoadColumn(10)]

public float P148 { get; set; }

[LoadColumn(11)]

public float P149 { get; set; }

[LoadColumn(12)]

public float P150 { get; set; }

[LoadColumn(13)]

public float P151 { get; set; }

[LoadColumn(14)]

public float P152 { get; set; }

[LoadColumn(15)]

public float P153 { get; set; }

[LoadColumn(16)]

public float P154 { get; set; }

[LoadColumn(17)]

public float P155 { get; set; }

[LoadColumn(18)]

public float P156 { get; set; }

[LoadColumn(19)]

public float P157 { get; set; }

[LoadColumn(20)]

public float P158 { get; set; }

[LoadColumn(21)]

public float P159 { get; set; }

[LoadColumn(22)]

public float P160 { get; set; }

[LoadColumn(23)]

public float P161 { get; set; }

[LoadColumn(24)]

public float P162 { get; set; }

[LoadColumn(25)]

public float P175 { get; set; }

[LoadColumn(26)]

public float P176 { get; set; }

[LoadColumn(27)]

public float P177 { get; set; }

[LoadColumn(28)]

public float P178 { get; set; }

[LoadColumn(29)]

public float P218 { get; set; }

[LoadColumn(30)]

public float P219 { get; set; }

[LoadColumn(31)]

public float P220 { get; set; }

[LoadColumn(32)]

public float P221 { get; set; }

[LoadColumn(33)]

public float P222 { get; set; }

[LoadColumn(34)]

public float P223 { get; set; }

[LoadColumn(35)]

public float P224 { get; set; }

[LoadColumn(36)]

public float P225 { get; set; }

[LoadColumn(37)]

public float P226 { get; set; }

[LoadColumn(38)]

public float P227 { get; set; }

[LoadColumn(39)]

public float P228 { get; set; }

[LoadColumn(40)]

public float P229 { get; set; }

[LoadColumn(41)]

public float P230 { get; set; }

[LoadColumn(42)]

public float P231 { get; set; }

[LoadColumn(43)]

public float P232 { get; set; }

[LoadColumn(44)]

public float P233 { get; set; }

[LoadColumn(45)]

public float P234 { get; set; }

[LoadColumn(46)]

public float P235 { get; set; }

[LoadColumn(47)]

public float P236 { get; set; }

[LoadColumn(48)]

public float P237 { get; set; }

[LoadColumn(49)]

public float P238 { get; set; }

[LoadColumn(50)]

public float P239 { get; set; }

[LoadColumn(51)]

public float P24 { get; set; }

[LoadColumn(52)]

public float P240 { get; set; }

[LoadColumn(53)]

public float P241 { get; set; }

[LoadColumn(54)]

public float P246 { get; set; }

[LoadColumn(55)]

public float P247 { get; set; }

[LoadColumn(56)]

public float P276 { get; set; }

[LoadColumn(57)]

public float P277 { get; set; }

[LoadColumn(58)]

public float P278 { get; set; }

[LoadColumn(59)]

public float P279 { get; set; }

[LoadColumn(60)]

public float P280 { get; set; }

[LoadColumn(61)]

public float P33 { get; set; }

[LoadColumn(62)]

public float P45 { get; set; }

[LoadColumn(63)]

public float P50 { get; set; }

[LoadColumn(64)]

public float P58 { get; set; }

[LoadColumn(65)]

public float P7 { get; set; }

[LoadColumn(66)]

public float P8 { get; set; }

[LoadColumn(67)]

public float P85 { get; set; }

[LoadColumn(68)]

public float P88 { get; set; }

}

StudentPrediction.cs:

public class StudentPrediction

{

[ColumnName("PredictedLabel")]

public uint PredictedClusterId;

[ColumnName("Score")]

public float[]? Distances;

}

Program.cs:

private static void Main(string[] args)

{

// Create an instance of the data

StudentsData newSample = new StudentsData();

// Create an instance of the trainer with a specific number of clusters

KMeansTrainer trainer = new KMeansTrainer(numberOfClusters: 5);

// Call the method to train, evaluate, and predict

TrainEvaluatePredict(trainer, newSample);

Console.WriteLine("Press any key to exit...");

Console.ReadKey();

}

static void TrainEvaluatePredict(ItrainerBase trainer, StudentsData newSample)

{

Console.WriteLine("\*\*\*\*\*\*\*\* " + $"{trainer.Name}" + " \*\*\*\*\*\*\*\*\*");

trainer.Fit("C:\\Users\\medis\\Desktop\\podaciML.csv");

var modelMetrics = trainer.Evaluate();

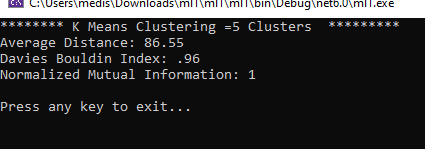
Console.WriteLine($"Average Distance: {modelMetrics.AverageDistance:#.##}{Environment.NewLine}" +

$"Davies Bouldin Index: {modelMetrics.DaviesBouldinIndex:#.##}{Environment.NewLine}" +

$"Normalized Mutual Information: {modelMetrics.NormalizedMutualInformation:#.##}{Environment.NewLine}");

trainer.Save();

}



Zakljucak:

Na osnovu rezultat s prethodne slike: Average Distance od 86.55 ukazuje da su tacke u klasterima blizu njihovom centru. Davies Bouldin Index od 0.96 ukazuje na razdvajanje izmedju klastera i kompaktnost unutar klastera, koje se moze poboljsati. Normalized Mutual Information ukazuje da su klasteri slicni stvarnim klasama ako su dostupni.