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**Roll No :- 46**

**Program No. :- 11.2**

**Practical Name :- Write a Program for Fuzzy c-means clustering in python.**

import numpy as np

import skfuzzy as fuzz

from skfuzzy import control as ctrl

# Generate some example data

np.random.seed(0)

data = np.random.rand(100, 2)

# Define the number of clusters

n\_clusters = 3

# Apply fuzzy c-means clustering

cntr, u, u0, d, jm, p, fpc = fuzz.cluster.cmeans(

data.T, n\_clusters, 2, error=0.005, maxiter=1000, init=None)

# Predict cluster membership for each data point

cluster\_membership = np.argmax(u, axis=0)

# Print the cluster centers

print('Cluster Centers:', cntr)

# Print the cluster membership for each data point

print('Cluster Membership:', cluster\_membership)

**Output :-**

Cluster Centers: [[0.22645397 0.71840176]

[0.52083891 0.18668653]

[0.76252289 0.60239021]]

Cluster Membership: [2 2 0 0 2 2 2 1 0 2 2 0 0 0 1 0

0 0 2 2 1 1 2 1 1 2 1 1 1 1 1 1 0 1 1 2 2

1 1 1 1 0 1 1 2 0 0 1 1 1 1 2 0 2 0 0 1 2 2 2 2 2 0

0 1 2 1 2 2 2 2 0 2 0

2 0 0 0 2 1 2 2 2 0 1 1 1 1 0 1 0 1 2 2 1 1 0 2 1 0]