SMA ASSIGNMENT-I

FIRST SEMESTER 2021-22

SUBMITTED BY

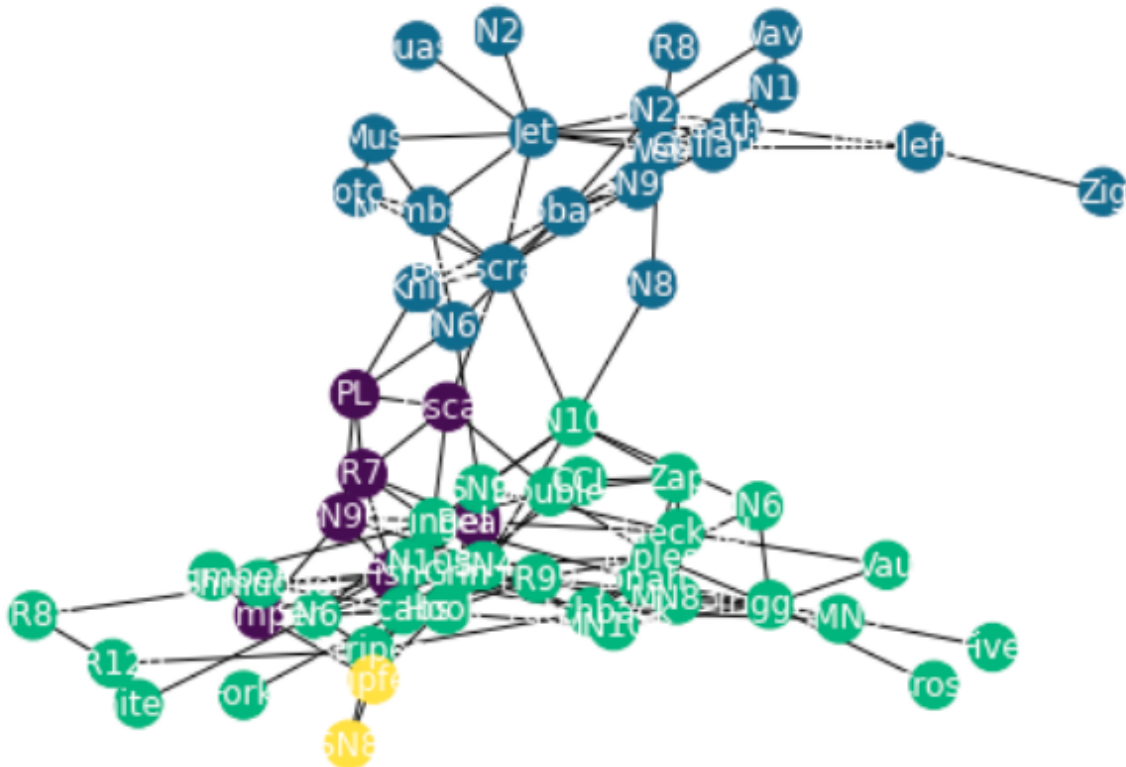### RAQEEB AHMED KHAN - 2020H1120264P
PUSHKAL GOYAL - 2020H1120271P

STATISTICS

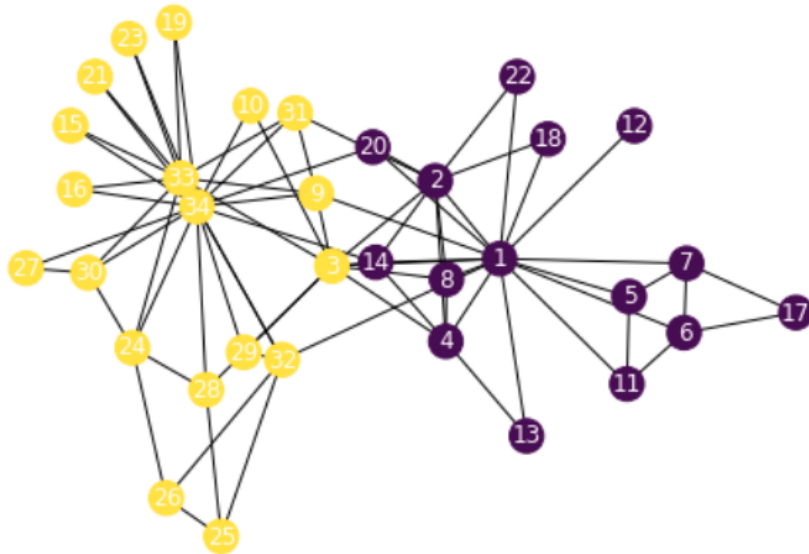| GRAPH	NODES	EDGES	AVG. PATH LENGTH	AVG. CLUSTERING COEFFICIENT
DOLPHINS	62	159	3.35	0.26
KARATE	34	78	2.41	0.57
JAZZ	198	2742	2.23	0.62

BETWEENNESS BASED CLUSTERING

- **Dolphins graph**
  - Number of clusters = 4
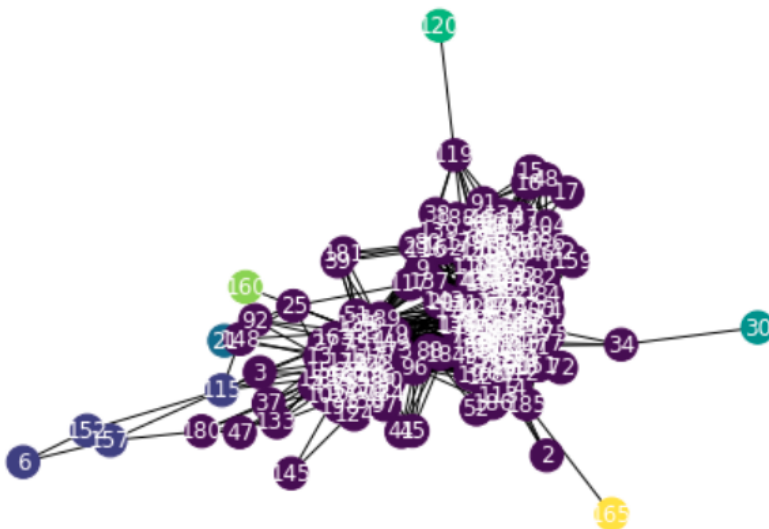 - Time taken = 0.14s
  - Modularity score = 0.45

- **Karate graph**
  - Number of clusters = 2
  - Time taken = 0.03s
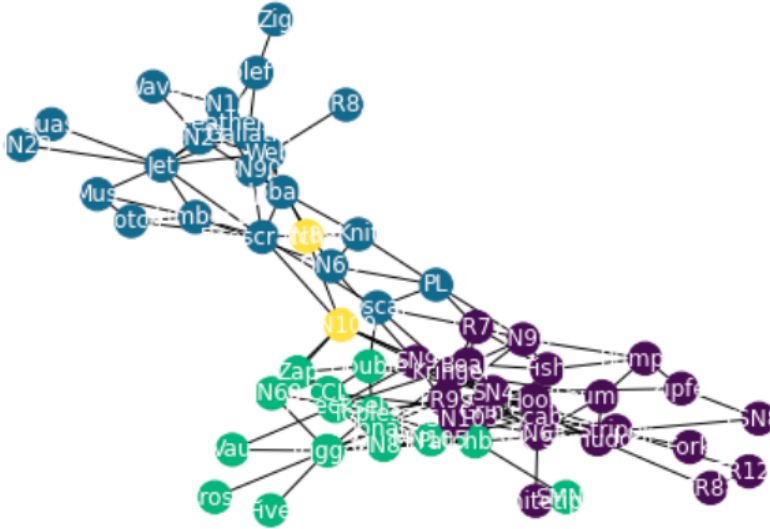 - Modularity score = 0.36

- **Jazz graph**
  - Number of clusters = 4
  - Time taken = 2.94s
  - Modularity score = 0.003
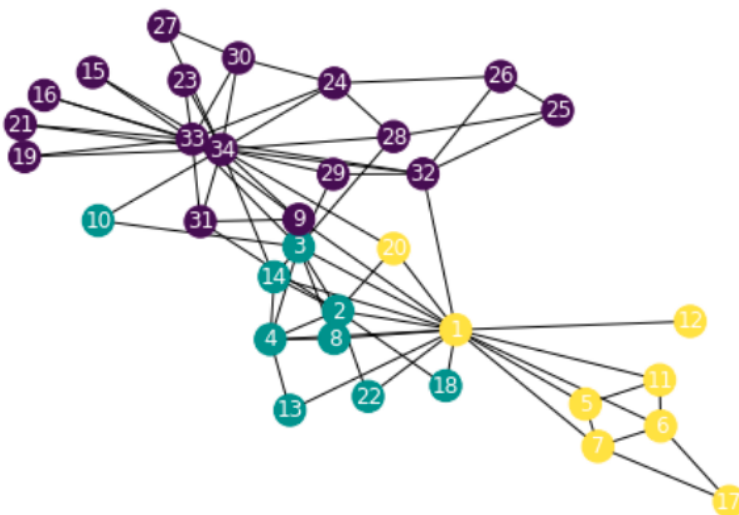
MODULARITY BASED CLUSTERING

- **Dolphins graph**
  - Number of clusters = 4
  - Time taken = 0.006s
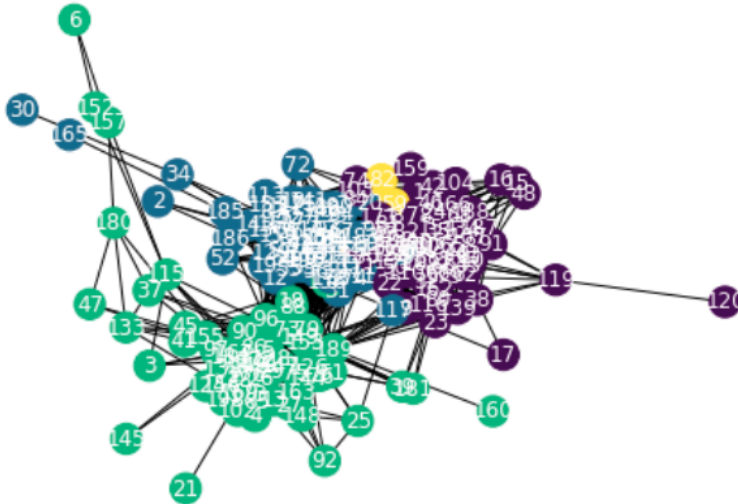 - Modularity score = 0.49

- **Karate graph**
  - Number of clusters = 3
  - Time taken = 0.004s
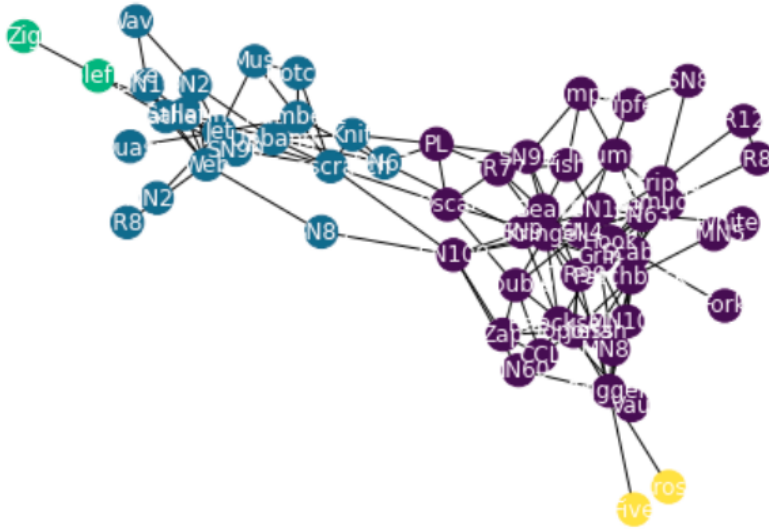 - Modularity score = 0.38

- **Jazz graph**
  - Number of clusters = 4
  - Time taken = 0.08s
  - Modularity score = 0.44
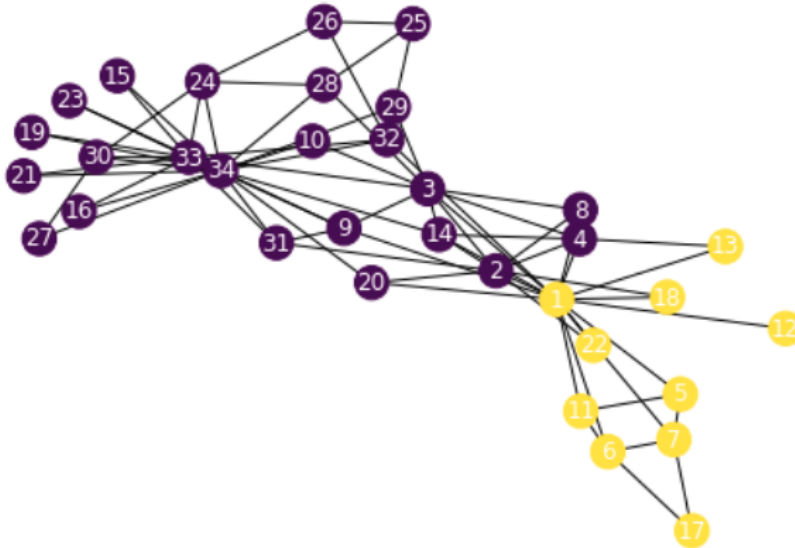

SPECTRAL CLUSTERING

- **Dolphins graph**
  - Number of clusters = 4
  - Time taken = 0.036s
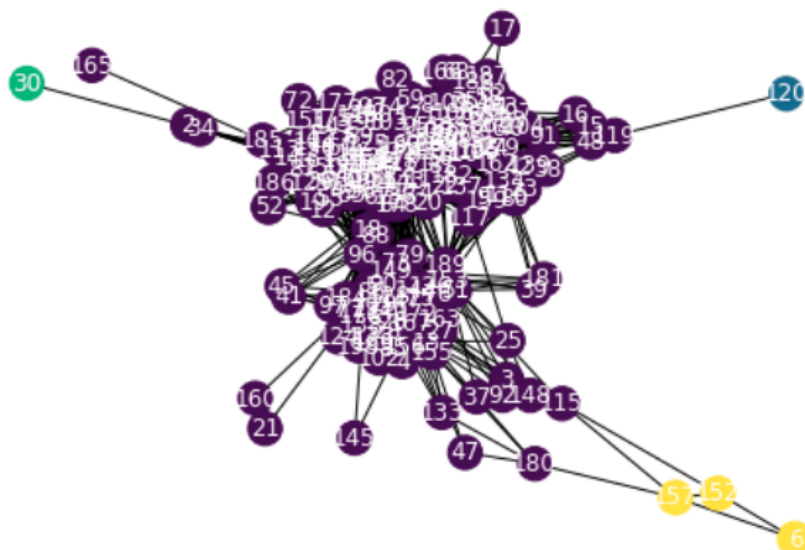 - Modularity score = 0.37

- **Karate graph**
  - Number of clusters = 2
  - Time taken = 0.018s
  - Modularity score = 0.233

- **Jazz graph**
  - Number of clusters = 4
  - Time taken = 0.03s
  - Modularity score = 0.002

OBSERVATIONS

Based on our observations, we found that modularity based clustering performs better than betweenness based and spectral clustering both in terms of time and modularity score.

Github:

The github repository for the code is: https://github.com/pushkal00/SMA-Assignment