

Exercises 5 Communities

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```
library(igraph)
```

```
##  
## Attaching package: 'igraph'  
## The following objects are masked from 'package:stats':  
##  
##      decompose, spectrum  
## The following object is masked from 'package:base':  
##  
##      union
```

Zachary Karate Club is a famous example traditionally used by network scientist of a university karate club described in the paper “An Information Flow Model for Conflict and Fission in Small Groups” by Wayne W. Zachary. The network became THE EXAMPLE of community structure in networks after its use by Michelle Girvan and Mark Newman in 2002.

```
## Zachary's karate club  
g <- make_graph("Zachary")
```

```
sg <- cluster_spinglass(g)
```

```
## Double check the result  
print(modularity(sg))
```

```
## [1] 0.4197896
```

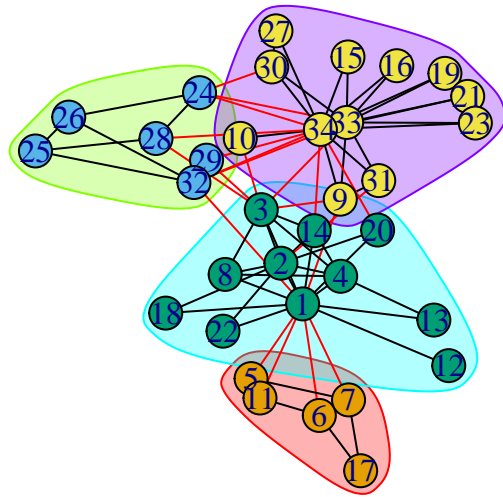
```
print(modularity(g, membership(sg)))
```

```
## [1] 0.4197896
```

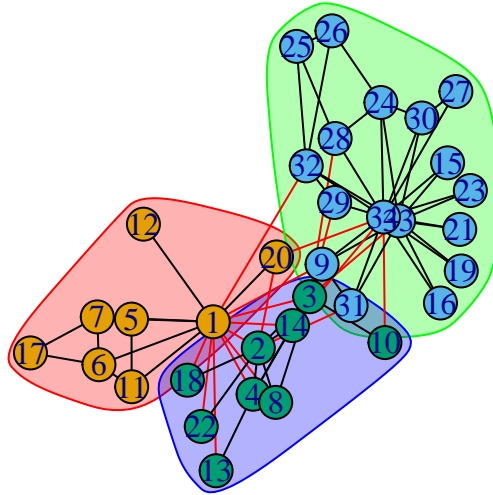
```
## Compare to the greedy optimizer  
fc <- cluster_fast_greedy(g)  
print(modularity(fc))
```

```
## [1] 0.3806706
```

```
plot(sg,g)
```



```
plot(fc,g)
```



```
membership(sg)
```

```
## [1] 3 3 3 3 1 1 1 3 4 4 1 3 3 3 4 4 1 3 4 3 4 3 4 2 2 2 4 2 2 4 4 2 4 4
```

```
membership(fc)
```

```
## [1] 1 3 3 3 1 1 1 3 2 3 1 1 3 3 2 2 1 3 2 1 2 3 2 2 2 2 2 2 2 2 2 2 2
```

You can compare community structures using various metrics

```
compare(fc,sg,method = "vi")
```

```
## [1] 0.8634332
```

```
metodos<-c("vi", "nmi", "split.join", "rand",
  "adjusted.rand")
comparative<-c()
for (i in 1:length(metodos)){
  comparative[i]<-compare(fc,sg,metodos[i])
}
comparative
```

```
## [1] 0.8634332 0.6340649 14.0000000 0.7789661 0.4873919
```

```
for (i in 1:length(metodos)){
  comparative[i]<-compare(fc,fc,metodos[i])
}
comparative
```

```
## [1] 0 1 0 1 1
```

Excercise

Using the Zachary's Karate Club and the classroom network clusterize them using at least four different methods. Compare your results