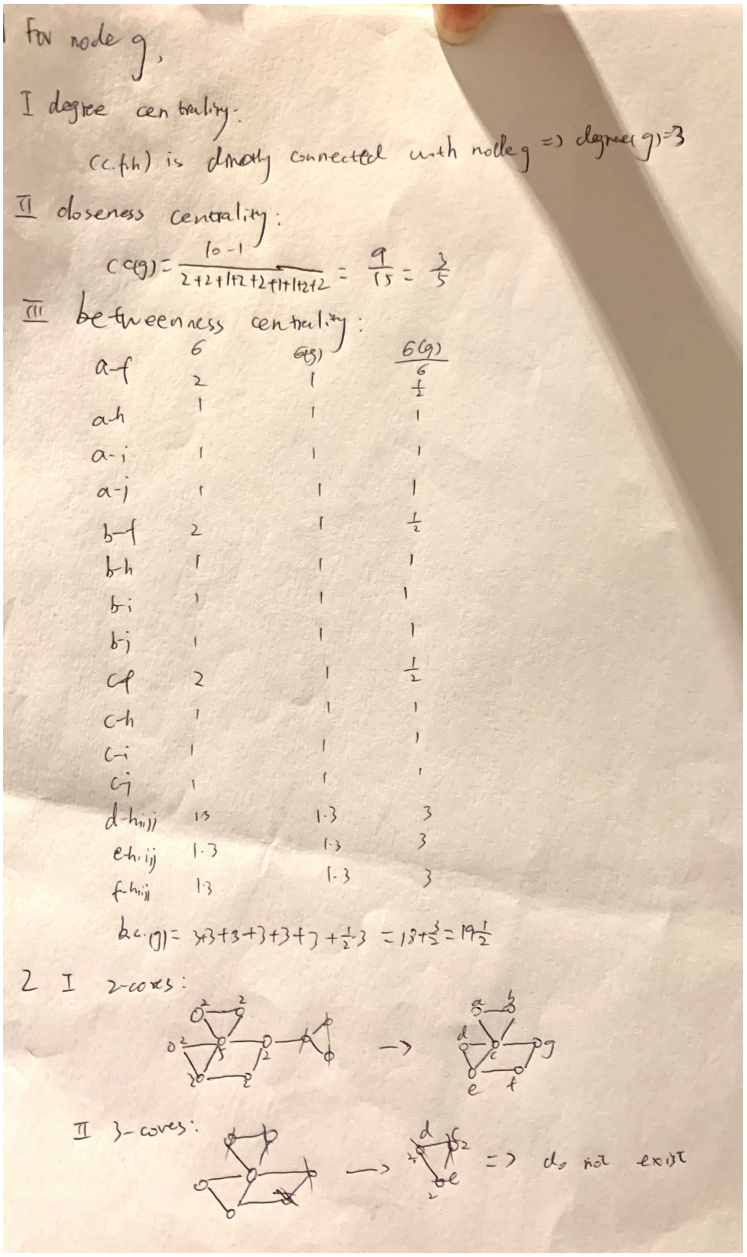
1Introduction

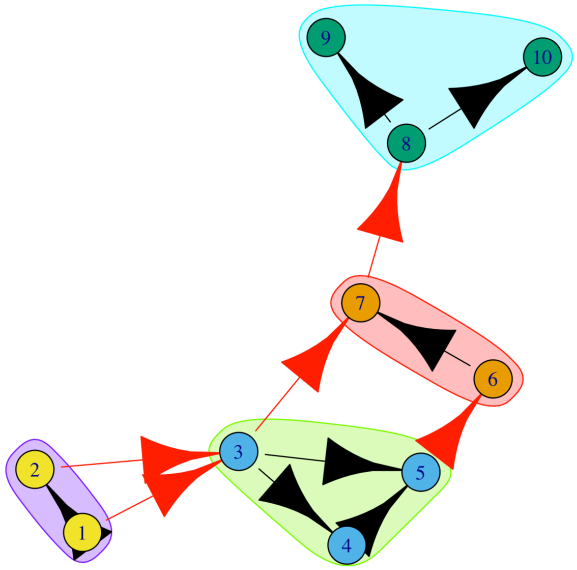
This is the solution of HW3 of Network Data, which consists of 4 parts. First, for node g, manually validate its degree centrality (3) ,closeness centrality (0.6) and betweenness centrality (19.5). Then, for the network, manually identify all 2-cores and 3-cores. After that, we need to apply R-function modularity() to this network and report the calculation result. Final, we need to apply R-function cluster_walktrap() to this network and draw the result with R-function plot().

2



3 After applying R-function modularity() to this network, the calculation result is 0.2951389.

4 After applying R-function cluster_walktrap() to this network, I draw the result with R-function plot() as below:



5 Appendix

```
> library(network)
> library(igraph)
> library(intergraph)
> netmat <- rbind(
+   c('a','b'),c('a','c'),c('b','c'),
+   c('c','d'),c('c','e'),c('c','g'),
+   c('d','e'),c('e','f'),c('f','g'),
+   c('g','h'),c('h','i'),c('h','j')
+ )
> net = network(netmat, matrix.type = 'edgelist')
> netmat2 <- as.matrix(net,matrix.type = 'adjacency')
> net2 <-network(netmat2,matrix.type = 'adjacency')
> inet <- asIgraph(net2)
> cw <- cluster_walktrap(inet)
> modularity(cw)
> plot(cw,inet)
```