Assignment4

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Q1

(a)

Yes, the politicians seem to form clusters with TD's voting along party lines

(b)

```
rm(list=ls())
load("/home/ian/Documents/git/STAT40810/assignments/dailvotes.Rdata", env <- new.env())
votes <- get('votes', env)
yes <- 1*(votes[,-(1:3)]=="y" )
group_size<-c()
aic <- c()
bic <- c()
for(i in  1:11){
  fit <- blca.em(yes, i, verbose = FALSE)
  group_size <- c(group_size, i)
  aic <- c(aic, fit$AIC)
  bic <- c(bic, fit$BIC)
}
df <- data.frame(group_size=group_size, aic=aic,bic=bic)
df %>% filter(or(aic == max(aic),bic == max(bic)))
```

```
##   group_size       aic       bic
## 1          3 -2330.473 -2551.424
## 2          9 -2164.928 -2834.005
```

Based on the AIC and BIC scores different cluster sizes could be argued for.

The BIC score is maximised when cluster size is 3. The AIC score is maximised when the cluster size is 8.

The plot of the cluster of size 3 shows a very clear separation within the group voting behaviour. Group 2 either voted against or abstained from voting, this is usually minority parties on the extremes of the political divide. Groups 1 and 3 are almost the inverse of one another with there voting patterns. Since Group 1 is larger than group 3, it is probably made up mainly of the parties in Government. The items voted for by Group 1 (probabilities close to 1) are most likely legislation they brought to the Dail which was voted agianst by both groups 2 and 3. The items voted for by Group 3 are most likely bills they produced whoch were always voted strongly against by Groups 1 and 2. Group 3 is most likely the main opposition party/grouping

Item Probabilities
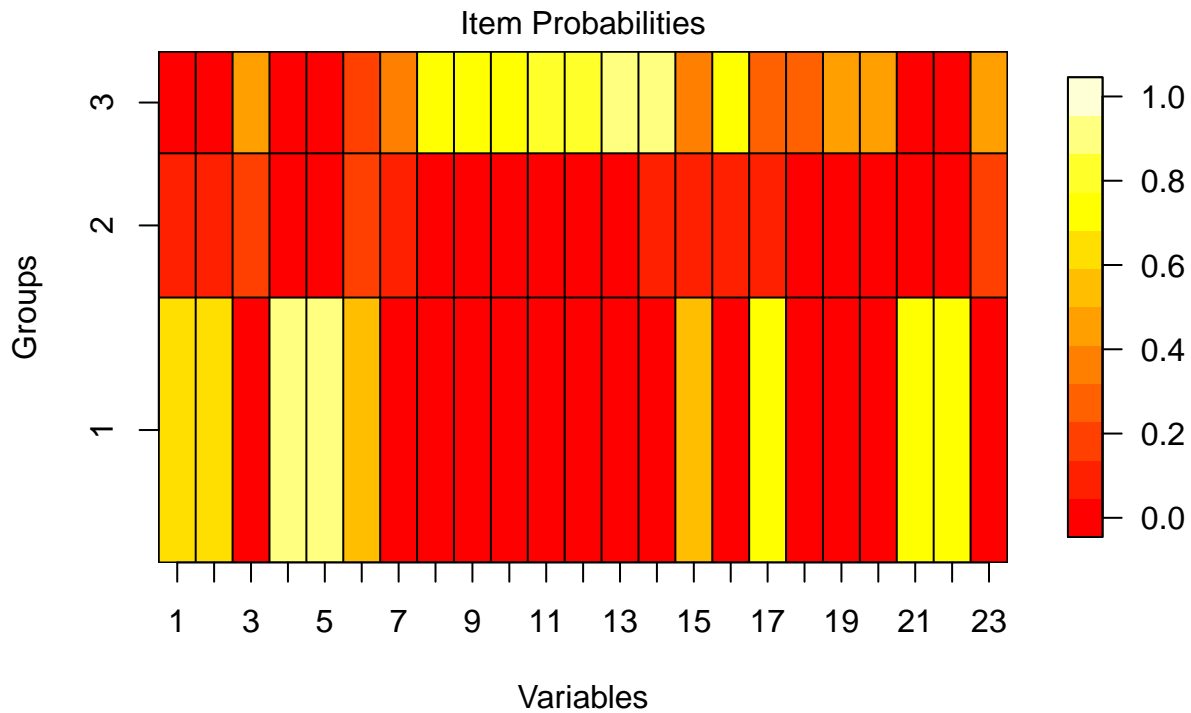
The plot of the cluster of size 8 is more complex to explain, but the different party voting patterns are still evident , with group 5 and 6 being reletively similar but are opposites of groups 2, 3, 4 which are similar, these could represent left / right groupings, group 1 comprises TD' who are negative to all legislation. Groups 7 and 8 most likely independent not bound by party position and are a little bit more dispersed in there voting pattern.

Item Probabilities