Module 1 Self Check

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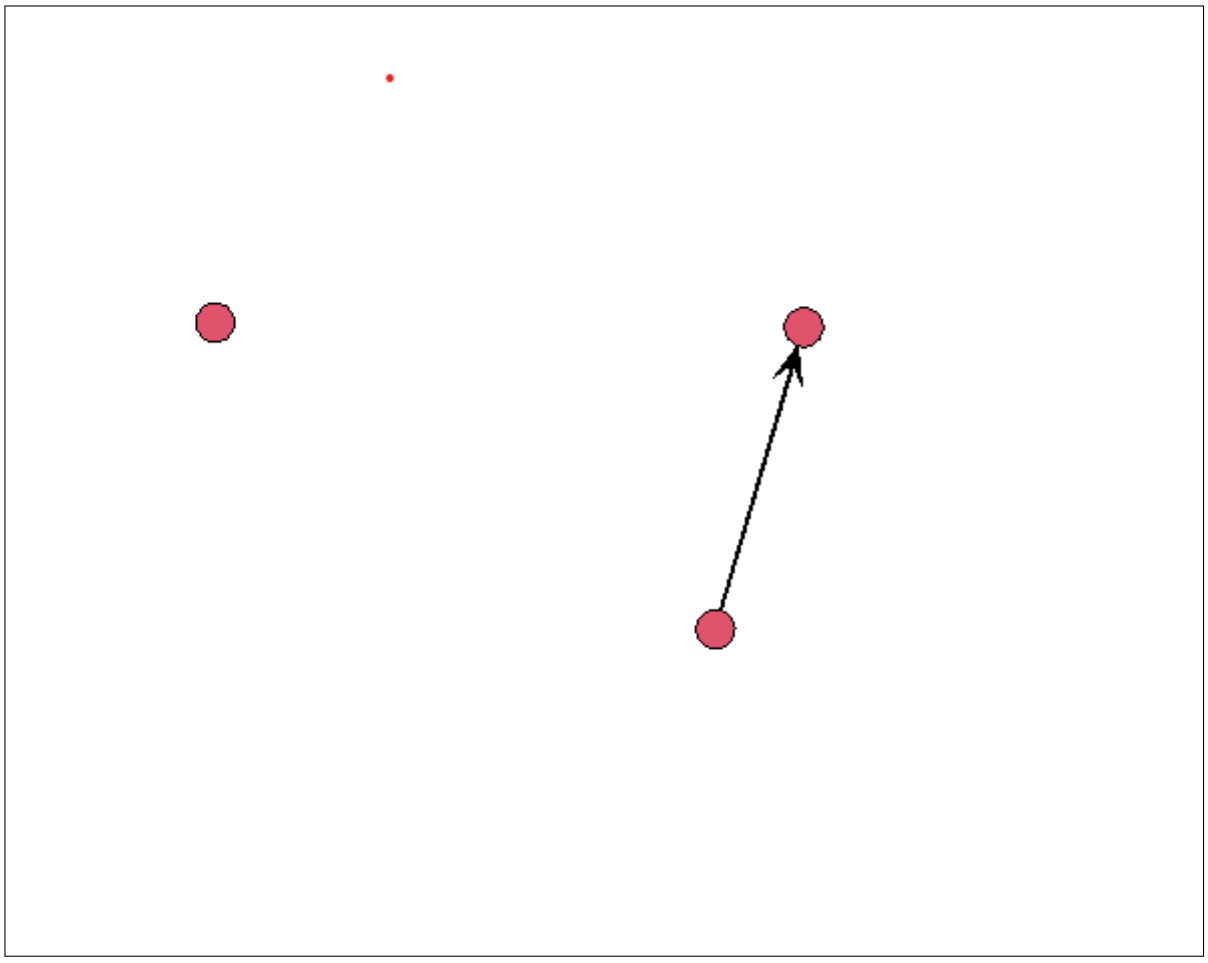
1 Part A

1. 3 Node Network



As shown in the image above a 3 Node network was generated with one node linked to another.

2 Part B

1. Highest Five Betweenness Centrality Scores

Names	sloan	karev	altman	torres	owen
Scores	461	318	306	277	162

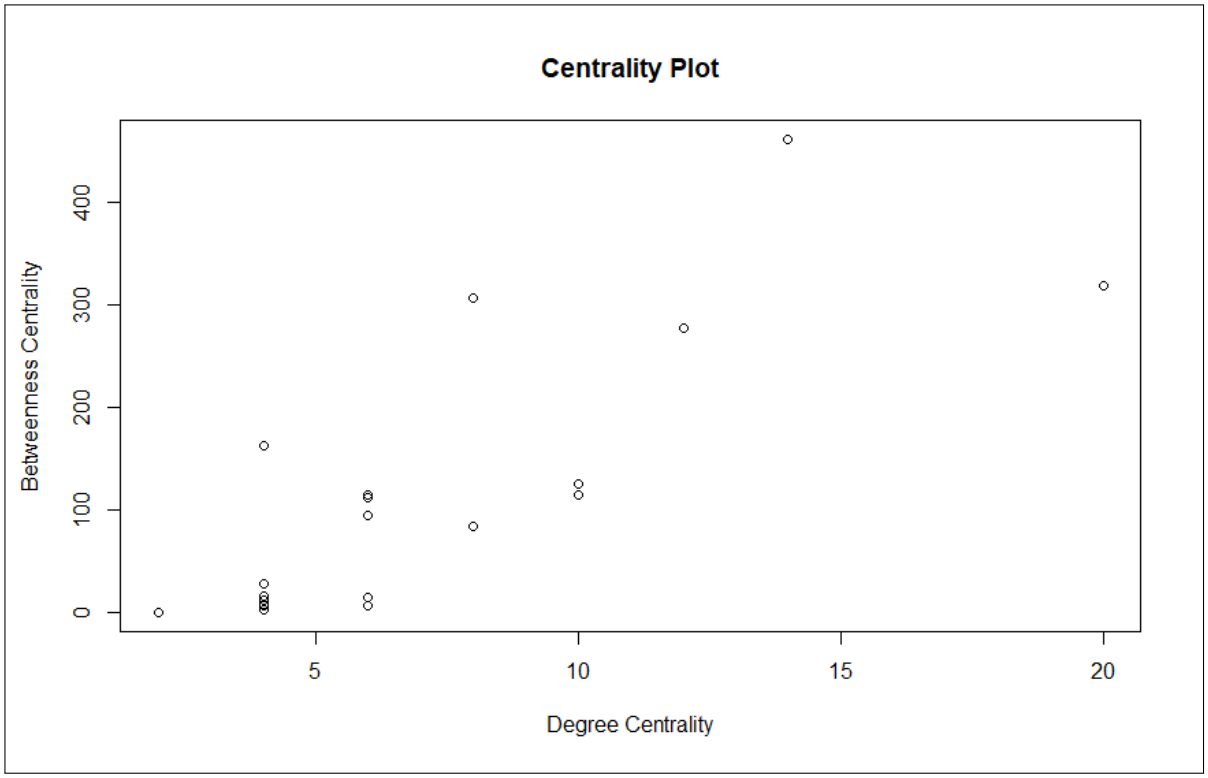
The Table above gives the 5 highest Betweeness Centrality Scores. Betweenness centrality measures the extent to which a node lies on the shortest path between other nodes in the network. As I have not watched the show I cannot confirm this but more than likely these characters would be heavily utilized in the show and may be main characters.

2. Highest Five Degree Centrality Scores

Names	karev	sloan	torres	grey	izzie
Scores	20	14	12	10	10

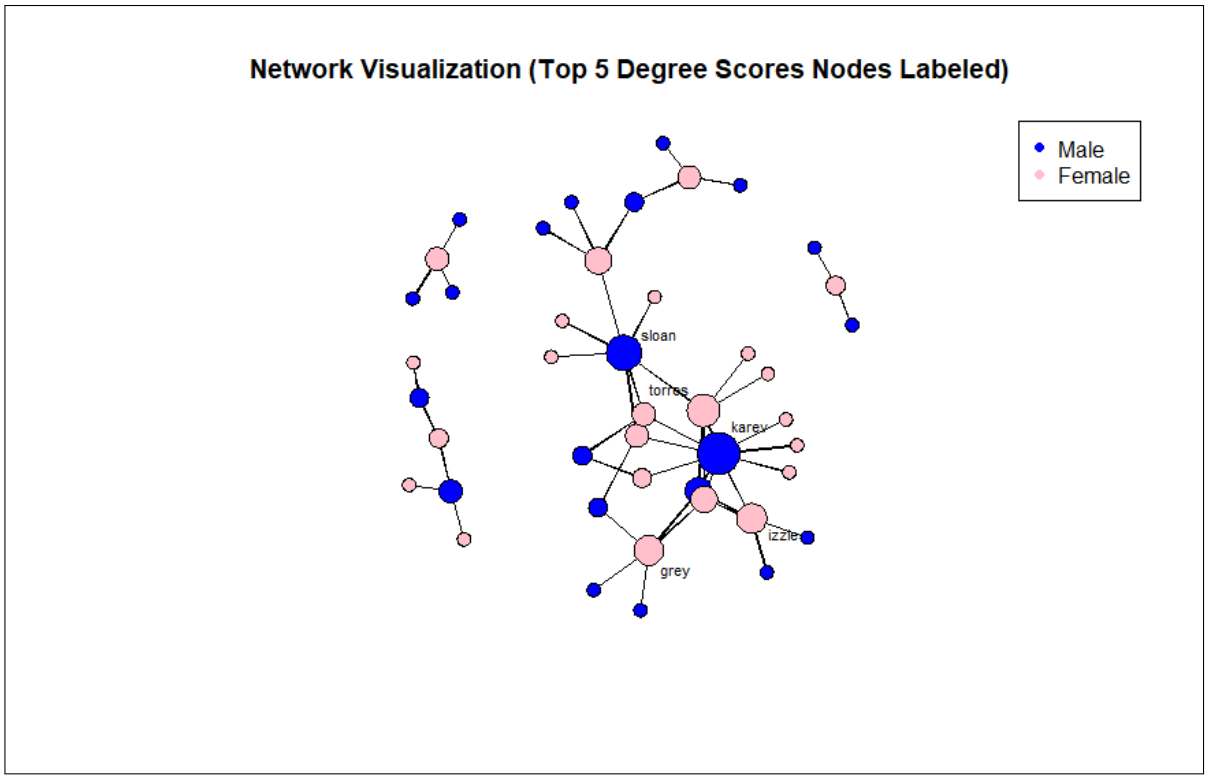
The Table above gives the 5 highest Degree Centrality Scores. Degree centrality measures the number of direct connections a node has. This one specifically relates the sexual contacts of a character to other characters. My statement earlier that the characters in these tables would be main stays of the show continues to make sense as the more screen time a character has the more likely sexual contact with other characters is.

3. Scores Plot



This Plot compares the betweenness and degree centrality scores between the characters. This plot helps determine whether characters who are central in terms of direct connections are also connectors between groups.

4. Social Network Plot



This Network Visualization plot displays the connections between nodes (characters) based on their degree scores. The top 5 are once again labeled and as we can see they have some of the largest nodes.

3 Part C

1. Racial Homophily

```
Maximum Likelihood Results:

               Estimate Std. Error MCMC % z value Pr(>|z|)
edges           -3.3574     0.2719      0 -12.349   <1e-04 ***
nodematch.race   0.7082     0.3233      0   2.191   0.0285 *
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

     Null Deviance: 1311.4  on 946  degrees of freedom
 Residual Deviance:  380.4  on 944  degrees of freedom

AIC: 384.4  BIC: 394.1  (Smaller is better. MC Std. Err. = 0)
```

Above is the output of R code to determine whether or not there is Racial Homophily. The main statistic to look at to determine this would be the nodematch.race line. The Estimated Std suggests that same race individuals are more likely to form connections than characters of different races.

2. Gender Homophily

```
Maximum Likelihood Results:

              Estimate Std. Error MCMC % z value Pr(>|z|)
edges          -2.3256     0.1598      0 -14.555   <1e-04 ***
nodematch.sex  -2.0073     0.4408      0  -4.553   <1e-04 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

     Null Deviance: 1311.4  on 946  degrees of freedom
 Residual Deviance:  354.1  on 944  degrees of freedom

AIC: 358.1  BIC: 367.8  (Smaller is better. MC Std. Err. = 0)
```

Above is the output of R code to determine if there is Gender Homophily within the show. In a complete reversal of the Racial Homophily Discussion, it is more likely that opposite genders are more likely to form connections than characters of the same gender.

3. What is Gender Homophily

   Gender homophily means that people tend to form relationships with others of the same gender.