Learning Outcomes and summary of tasks.

- **Understand basics of Graph analysis**

1. Use `read.table` to download data-frames from the following links
   http://sna.stanford.edu/sna_R_labs/data/Krack-High-Tec-edgelist-Advice.txt
   http://sna.stanford.edu/sna_R_labs/data/Krack-High-Tec-edgelist-Friendship.txt
   http://sna.stanford.edu/sna_R_labs/data/Krack-High-Tec-edgelist-ReportsTo.txt
   http://sna.stanford.edu/sna_R_labs/data/Krack-High-Tec-Attributes.csv
   The first three are graphs of 21 people based on their relationships (advice, friendship or reports-to). Last link shows the attributes of the link
   2. Change the column names of the three data frames as below, and merge on ego.

```
colnames(advice_data_frame) <- c('ego', 'alter', 'advice_tie')
colnames(friendship_data_frame) <- c('ego', 'alter', 'friendship_tie')
colnames(reports_to_data_frame) <- c('ego', 'alter', 'reports_to_tie')
```

   3. Remove those rows, whose friendship, advice and reports-to are all zero. Create a graph object using `graph.data.frame(data = df, vertices = cbind(1:nrow(attributes), attributes))` on the subsetted dataframe.
   4. Subset the graph to show only edges of advice using, `krack_advice_only <- delete.edges(krack_full, E(krack_full)[get.edge.attribute(krack_full, name = "advice_tie") == 0])`, and so on
   5. Plot the graph with edges for only reports_to_tie
      a. Color the nodes using the department
      b. Change the size of the vertex based on the tenure attribute of the vertex
      c. Now, change the size of the vertex based on the authority score of friendship.
   6. Save the layout and use it to plot the graph with edges for only friendship_tie
   7. How many friends does the person representing the central vertex has? Who has the most number of friends?
   8. Who has the maximum betweenness in the report_to_tie graph
   9. Highlight the shortest path between 1 and 13 the same graph
   10. Find and plot the communities in the same graph