# exercise2

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2024-03-26

## Load necessary libraries

library(igraph)

## Create a graph

g <- graph.empty(directed = FALSE)

## Add nodes for the seats

nodes <- c('1', '2', '3', '4', '5', '6', 'A', 'B', 'C', 'D') g <- add.vertices(g, nv=length(nodes), name=nodes)

## Add edges between adjacent seats

edges <- c('1', 'A', '1', '2', '2', 'B', '2', '3', '3', 'C', '3', 'D', '3', '4', '4', '5', '5', 'D', '5', '6') g <- add.edges(g, edges)

## Calculate centrality measures for each open seat

degree_centrality <- degree(g) / (vcount(g) - 1) closeness_centrality <- closeness(g) betweenness_centrality <- betweenness(g)

## Extract centrality measures for open seats only

open_seats <- c('A', 'B', 'C', 'D') degree_centrality_open <- degree_centrality[open_seats] closeness_centrality_open <- closeness_centrality[open_seats] betweenness_centrality_open <- betweenness_centrality[open_seats]

## Print the centrality measures

print("Degree centrality:") print(degree_centrality_open) print("Closeness centrality:") print(closeness_centrality_open) print("Betweenness centrality:") print(betweenness_centrality_open)

## Plot the network graph

plot(g, vertex.size=20, vertex.label=V(g)$name, vertex.color=c("white", "white", "white", "white", "white", "white", "yellow", "yellow", "yellow", "yellow"), edge.arrow.size=0.5, main="Bus Seat Network Graph")

## R Markdown

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see http://rmarkdown.rstudio.com.

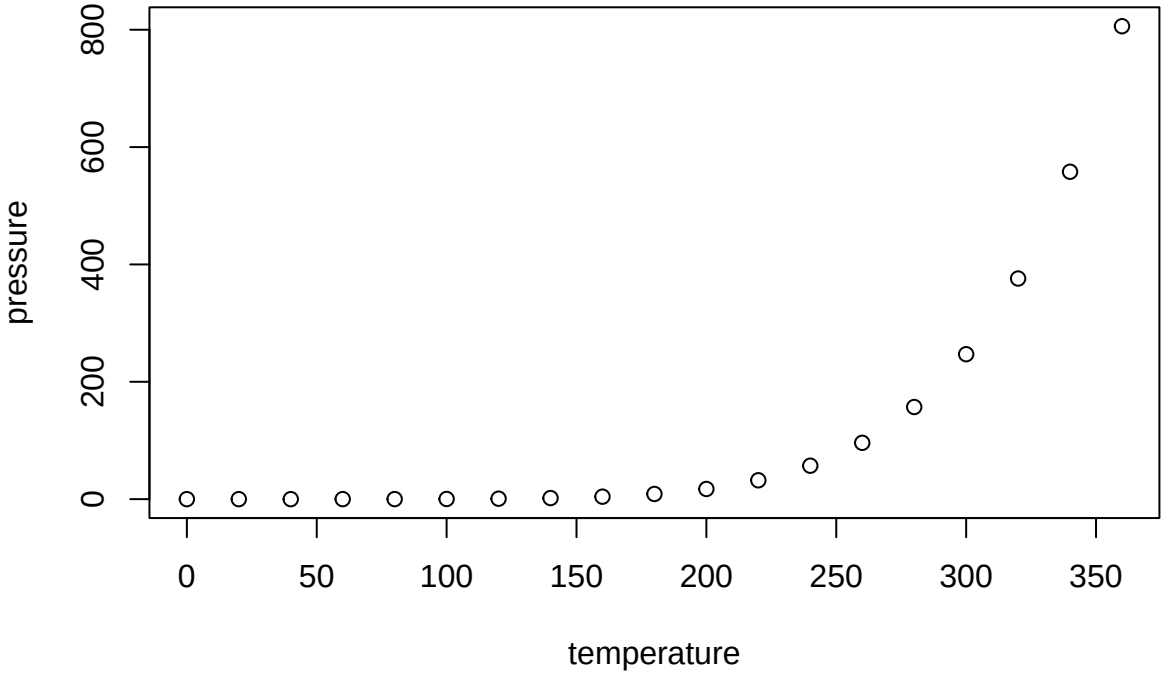
When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
summary(cars)
```

```
##      speed           dist
##  Min.   : 4.0   Min.   :  2.00
##  1st Qu.:12.0   1st Qu.: 26.00
##  Median :15.0   Median : 36.00
##  Mean   :15.4   Mean   : 42.98
##  3rd Qu.:19.0   3rd Qu.: 56.00
##  Max.   :25.0   Max.   :120.00
```

## Including Plots

You can also embed plots, for example:




Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.