CSE3020 - Data Visualisation
Lab Final Assessment Test

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Question/Task

5. Creating a Network (reg-flow and reg-plot)
- Labelling the nodes and Colouring Vertices
- Remove duplicates/loops
- Find the number of regions
- Highlight (colour) the path from "western asia" in the network
- Show shorts path for any 4 regions

Source Code and Screenshots

#SETTING UP DATA FOR NETWORK CREATION

```
# 18BCE0715 - Sanjit Kumar - Lab FAT


reg_flow <- read_csv("/Users/sanjitkumar/Documents/VIT_DOC/vit_semester_6/B2 - Data Visualisation/lab/final_assessment_test/reg_flow.csv")

reg_plot <- read_csv("/Users/sanjitkumar/Documents/VIT_DOC/vit_semester_6/B2 - Data Visualisation/lab/final_assessment_test/reg_plot.csv")


reg_flow


head(reg_flow)
head(reg_plot)
```

```
links1 <- as.matrix(reg_flow)

nodes1 <- reg_plot


dim(links1)

dim(nodes1)
```
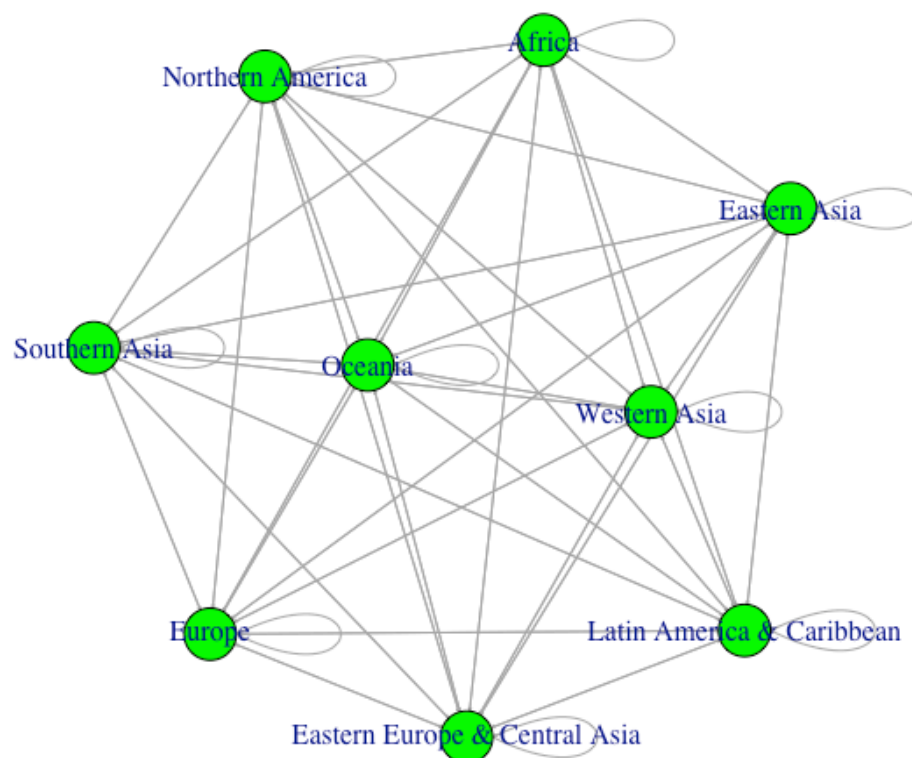
COLORING VERTICES AND LABELLING THE NODES
```
net1 <- graph.data.frame(links1, nodes1, directed=T)
plot(net1, edge.arrow.size=.1,vertex.label=V(net1)$regionm,vertex.color="green")
```
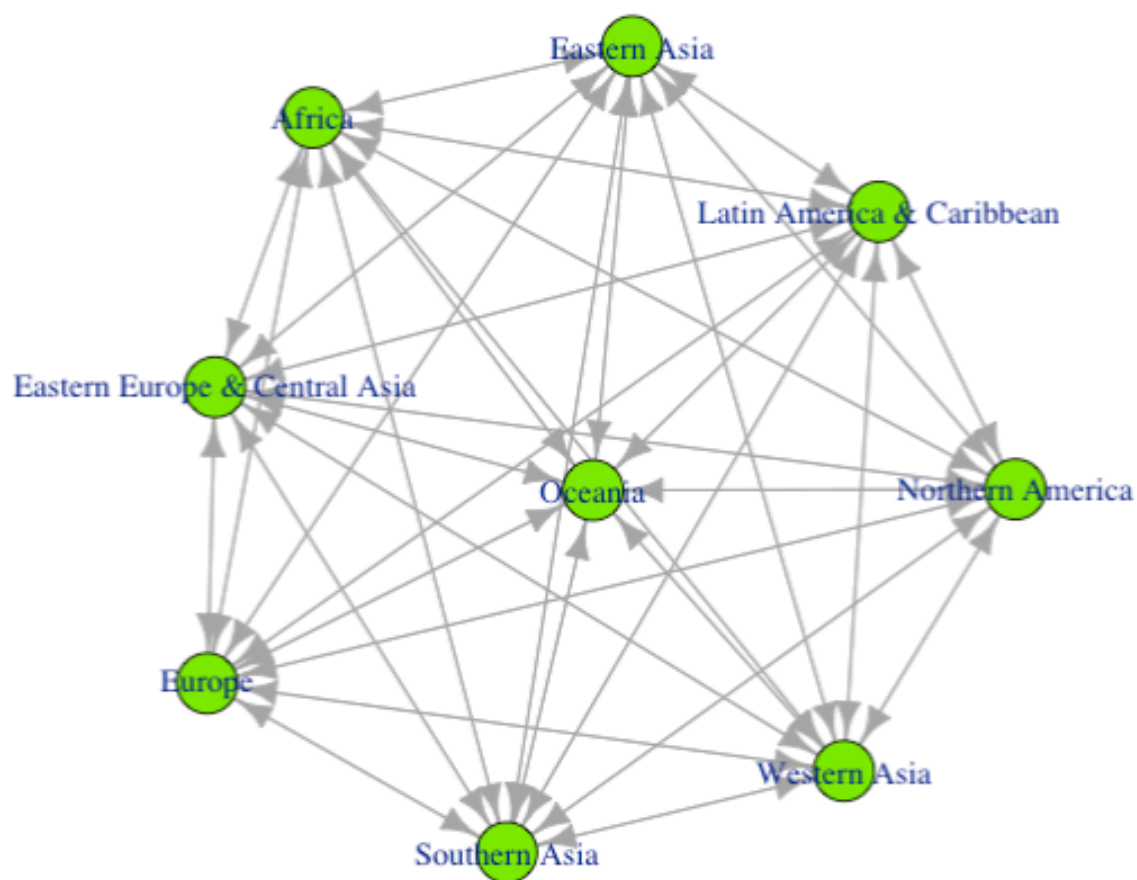
REMOVE DUPLICATES and LOOPS

```
plot(net1, remove.loops = TRUE,vertex.label=V(net1)$region, vertex.color="green")
net2 <- simplify(net1, remove.multiple = F, remove.loops = T)
plot(net2, remove.loops = TRUE,vertex.label=V(net1)$region, vertex.color="green")
```

# FINDING NUMBER OF REGIONS
no_of_regions = count(nodes1$region)
no_of_regions

```
> no_of_regions = count(nodes1)
> no_of_regions
# A tibble: 1 x 1
      n
  <int>
1     9
>
```

#SHORTEST DISTANCES
distances(net2)
dist.from.Oceania <- distances(net2, v=V(net2)["Oceania"], to=V(net2), weights=NA)

path1 <- shortest_paths(net2,
                from = V(net2)["Oceania"],
                to = V(net2)["Western Asia"],
                output = "both")

path2 <- shortest_paths(net2,
                 from = V(net2)["Eastern Asia"],
                to = V(net2)["Western Asia"],
                output = "both")

path3 <- shortest_paths(net2,
                 from = V(net2)["Oceania"],
                to = V(net2)["Western Asia"],
                output = "both")

path4 <- shortest_paths(net2,
                 from = V(net2)["Europe"],
                to = V(net2)["Northern America"],
)
path4
path5 <- shortest_paths(net2,
                 from = V(net2)["Southern Asia"],

```
             to  = V(net2)["Western Asia"],
             output = "both")
```

```
> path1
    s01 s02 s03 s04 s05 s06 s07 s08 s09 s10 s11 s12 s13 s14 s15 s16 s17
s01   0   1   1   1   1   2   2   2   2   2   2   2   3   3   1   3   2
>
```

```
$epath
$epath[[1]] $epath
+ 3/51 edge list()
[1] s08->s0
```

```
$epath
$epath[[1]]
+ 3/51 edges from c269d48 (vertex names):
[1] s08->s03 s03->s05 s05->s01
```

```
$epath
list()
```

```
$epath
$epath[[1]]
+ 1/51 edge from c269d48 (vertex names):
[1] s04->s11
```

Highlighting given edges set

```
#HIGHLIGHTING GIVEN PATH
E(net2)
E(net2)$color[E(net2)$region == "Western Asia"] <- 'green'
plot(net2, remove.loops = TRUE,vertex.label=V(net1)$region, vertex.color="green")

path0 <- distances(net1, v=V(net1)[region=="Western Asia"], to=V(net), weights=NA)
my_color <- colorRampPalette(c("dark red", "gold"))
col <- my_color(path0)
```