Course 3 Step 1.15 - Network data

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Mad Man

Using geomnet to work with network data

```
# library
library(tidyverse)
library(geomnet)

# Load madmen (list of 2 data frames)
data(madmen)
```

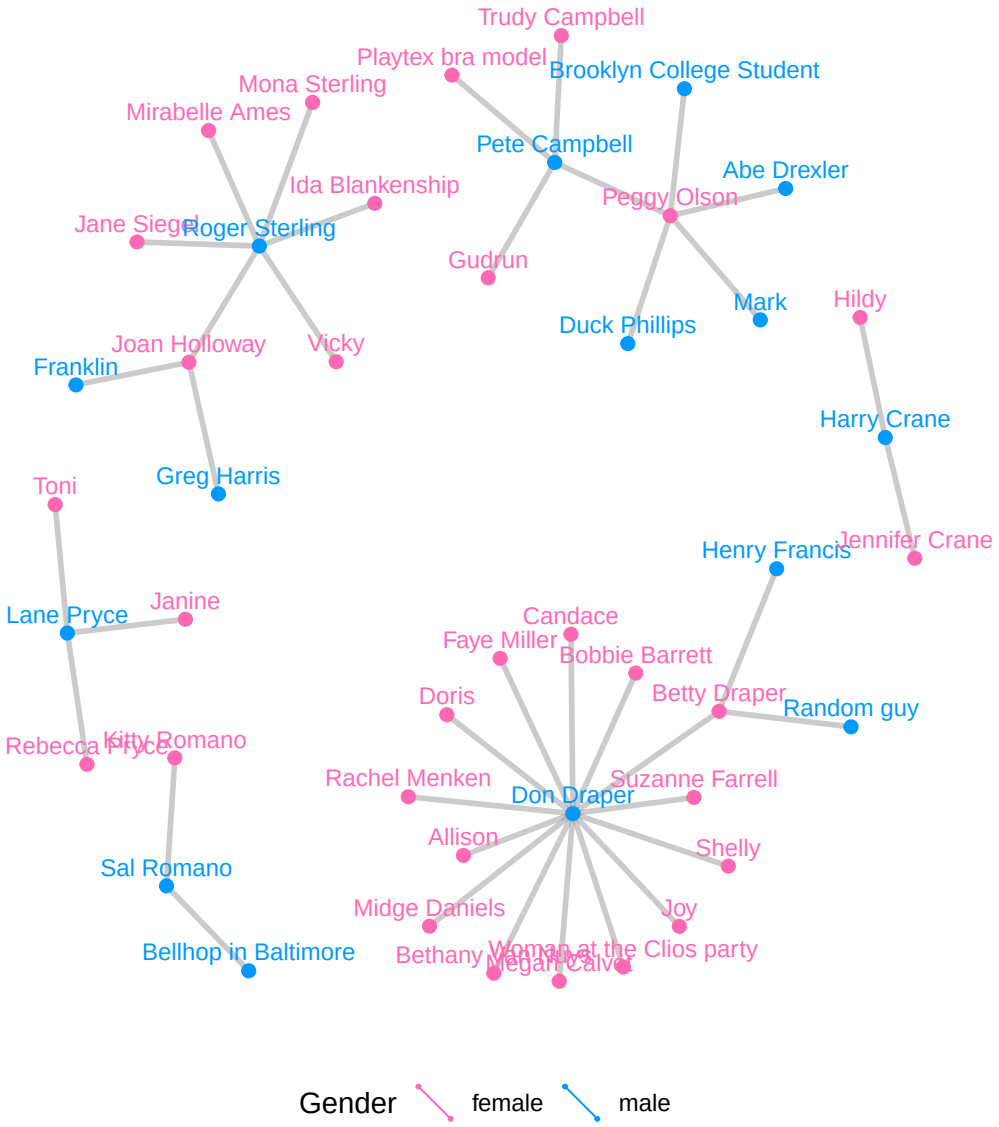
Apply some data pre-processing

Use the fortify() function to join the vertices and edges data (madmen*verticesandmadmen*edges).

```
# Data step: Join the edge and node data with a fortify call
MMnet <- fortify(as.edgedf(madmen$edges), madmen$vertices)
```

Positioning associated vertices

```
# Create network diagram
set.seed(5556677) # seed set to ensure that network diagram does not change on each run

ggplot(data = MMnet, aes(from_id = from_id, to_id = to_id)) +
  geom_net(aes(colour = Gender), layout.alg = "kamadakawai", # Layout algorithm
           size = 2, labelon = TRUE, vjust = -0.6, ecolour = "grey60",
           directed = FALSE, fontsize = 3, ealpha = 0.5) +
  scale_colour_manual(values = c("#FF69B4", "#0099ff")) +
  xlim(c(-0.05, 1.05)) +
  theme_net() +
  theme(legend.position = "bottom")
```



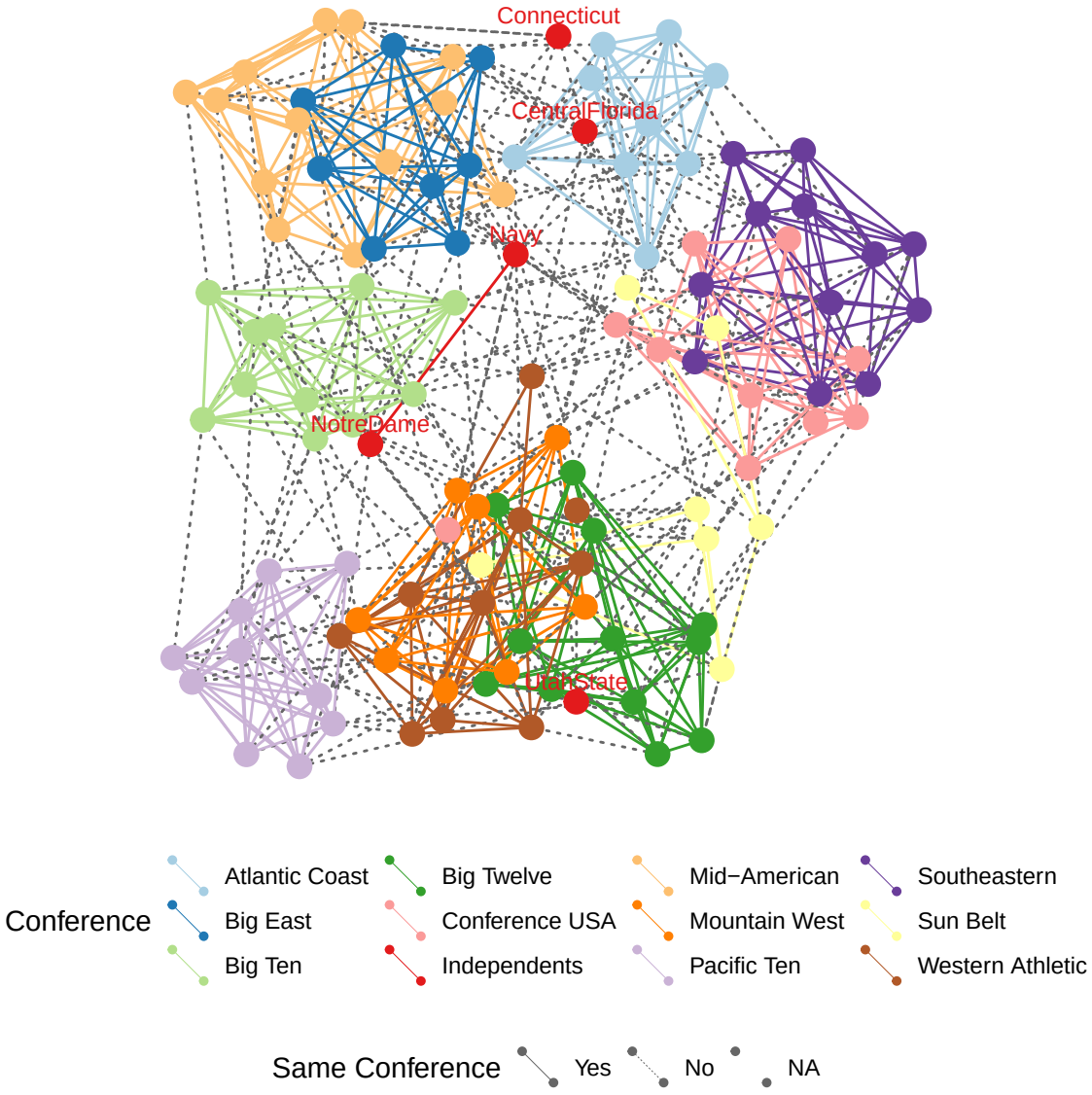
American college football

```
# Load football (list of 2 data frames)
data(football)
```

Join the vertices and edges data frame, and create a variable

```
# Join the edge and node data with a fortify call
ftnet <- fortify(as.edgedf(football$edges), football$vertices)

# Label independent schools
ftnet$schools <- ifelse(ftnet$value == "Independents", ftnet$from, "")

# Create network diagram
set.seed(1)
```

```
ggplot(data = ftnet, aes(from_id = from_id, to_id = to_id)) +
  geom_net(aes(colour = value,
               group = value,
               linetype = factor(1-same.conf),
               label = schools),
           linewidth = 0.5,
           size = 4,
           fontsize = 3,
           vjust = -0.75,
           alpha = 0.5,
           layout.alg = 'fruchtermanreingold') +
  scale_linetype_discrete(name = "Same Conference", labels = c("Yes", "No", "NA")) +
  theme_net() +
  theme(legend.position = "bottom", legend.box = "vertical") +
  guides(colour = guide_legend(order = 1),
         linetype= guide_legend(order = 2)) +
  scale_colour_brewer("Conference", palette = "Paired")
```



Give it a go!

Further develop your skills and knowledge of working with data by creating network diagrams based on characters in Harry Potter.

In the network diagram, the Harry Potter characters will be the vertices and the edges occur if one character provides emotional support to the other at some point in the book.

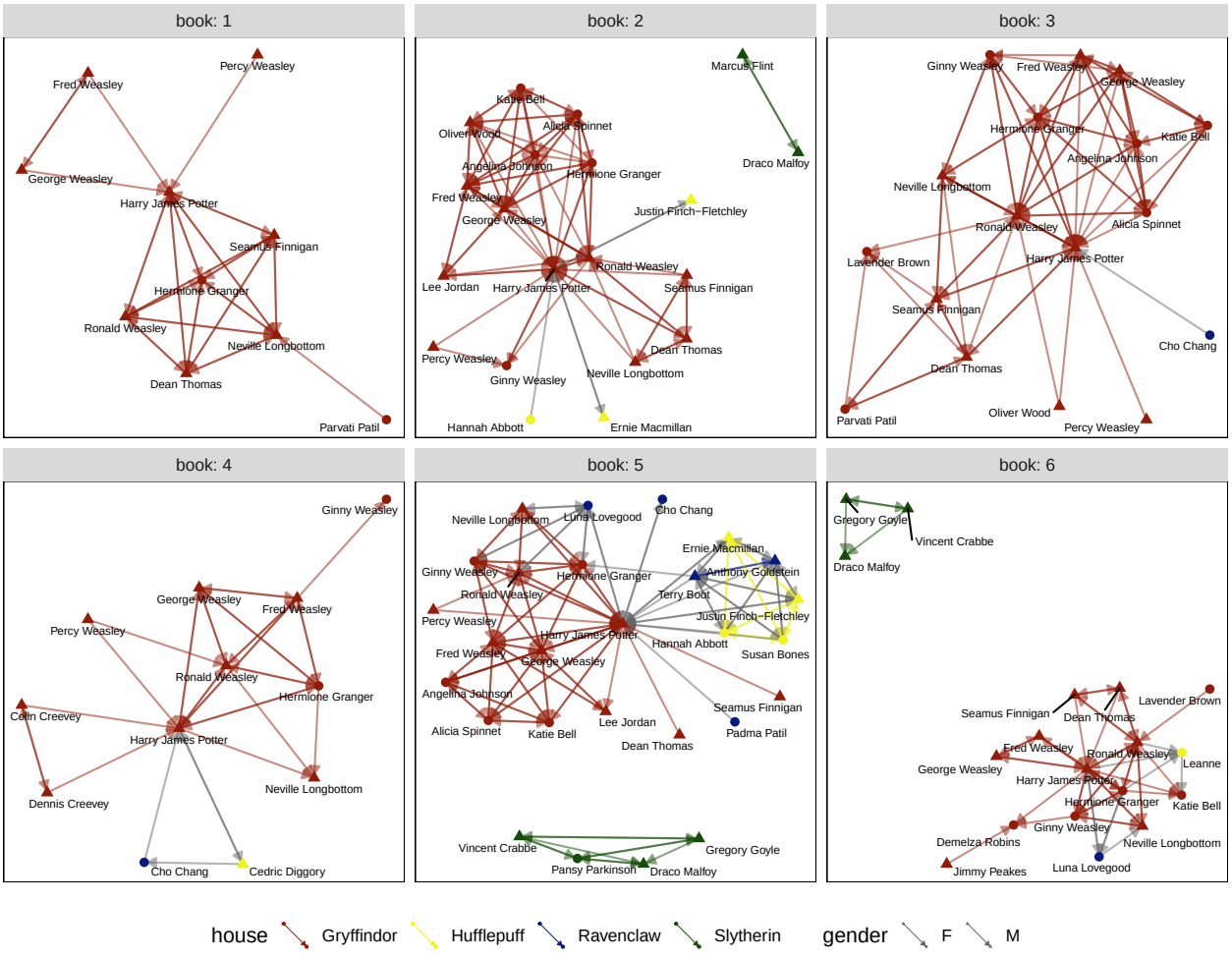
Load the data

```
# URL of raw text of HP characters
hp.chars_URL <- "https://raw.githubusercontent.com/datascienceprogram/ids_course_data/master/hp.chars.cs

# Read HP characters data
hp.chars <- read_csv(hp.chars_URL)

# URL of raw text of HP edges
hp.edges_URL <- "https://raw.githubusercontent.com/datascienceprogram/ids_course_data/master/hp.edges.cs

# Read HP edges data
hp.edges <- read_csv(hp.edges_URL)

# Convert to data frame object
hp.chars <- as.data.frame(hp.chars)
hp.edges <- as.data.frame(hp.edges)
```

Determine the edges and vertices

Create a facetted network diagram of the Harry Potter characters.

```
# Join the edge and node data with a fortify call
hp.all <- fortify(as.edgedf(hp.edges), hp.chars, group = "book") # group by HP book for facetting

# Create network diagram facetted by book
set.seed(12345)
ggplot(data = hp.all, aes(from_id = from, to_id = to_id)) +
  geom_net(fiteach=T, directed = T, size = 2, linewidth = .5,
           ealpha = .5, labelon = T, fontsize = 2, repel = T,
           labelcolour = "black", arrowsize = .5, singletons = FALSE,
           aes(colour = house, group = house, shape = gender)) +
  scale_colour_manual(values = c("#941B08","#F1F31C",
                                 "#071A80", "#154C07")) +
  facet_wrap(~book, labeller = "label_both", ncol = 3) +
  theme_net() +
  theme(panel.background = element_rect(colour = 'black'), legend.position = "bottom")
```


book: 1
Percy Weasley
Fred Weasley
George Weasley
Harry James Potter
Seamus Finnigan
Hermione Granger
Ronald Weasley
Neville Longbottom
Dean Thomas
Parvati Patil
book: 2
Marcus Flint
Katie Bell
Alicia Spinnet
Oliver Wood
Angelina Johnson
Hermione Granger
Draco Malfoy
Fred Weasley
George Weasley
Justin Finch−Fletchley
Ronald Weasley
Lee Jordan
Harry James Potter
Seamus Finnigan
Dean Thomas
Percy Weasley
Ginny Weasley
Neville Longbottom
Hannah Abbott
Ernie Macmillan
book: 3
Ginny Weasley
Fred Weasley
George Weasley
Hermione Granger
Katie Bell
Angelina Johnson
Neville Longbottom
Ronald Weasley
Alicia Spinnet
Lavender Brown
Harry James Potter
Seamus Finnigan
Cho Chang
Dean Thomas
Parvati Patil
Oliver Wood
Percy Weasley
book: 4
Ginny Weasley
George Weasley
Fred Weasley
Percy Weasley
Ronald Weasley
Hermione Granger
Colin Creevey
Harry James Potter
Neville Longbottom
Dennis Creevey
Cho Chang
Cedric Diggory
book: 5
Neville Longbottom
Luna Lovegood
Cho Chang
Ernie Macmillan
Ginny Weasley
Hermione Granger
Anthony Goldstein
Ronald Weasley
Terry Boot
Percy Weasley
Justin Finch−Fletchley
Harry James Potter
Hannah Abbott
Fred Weasley
George Weasley
Susan Bones
Angelina Johnson
Seamus Finnigan
Alicia Spinnet
Katie Bell
Lee Jordan
Padma Patil
Dean Thomas
Vincent Crabbe
Gregory Goyle
Pansy Parkinson
Draco Malfoy
book: 6
Gregory Goyle
Vincent Crabbe
Draco Malfoy
Seamus Finnigan
Dean Thomas
Lavender Brown
Fred Weasley
Ronald Weasley
Leanne
George Weasley
Harry James Potter
Hermione Granger
Katie Bell
Ginny Weasley
Demelza Robins
Neville Longbottom
Jimmy Peakes
Luna Lovegood
house
Gryffindor
Hufflepuff
Ravenclaw
Slytherin
gender
F
M