Chen.R

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```
# Data Visualization - EChen & CDelaney 2/23/2020
# Complete Chart Assignment
# Start Code
```

```
# Load packages ggplot, scales, dplyr, extrafont
library(ggplot2)
library(scales)
library(dplyr)
```

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag
```

```
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
# load 4 movie data files, all sourced from imdb.com
# this file contains unique movie title ids, actual title names, year produced, genre
main.movie.file <- read.csv("/Users/erikchen/Desktop/Data Viz Programs/Policy Brief/Data Files/title.bas
# this file contains unique movie title ids, average ratings, and number of votes
movies.ratings <- read.csv("/Users/erikchen/Desktop/Data Viz Programs/Policy Brief/Data Files/title.rati
# this file contains unique actor ids and their associated role in a film
movies.staractor <- read.csv("/Users/erikchen/Desktop/Data Viz Programs/Policy Brief/Data Files/title.pr
#  this file contains the actual names of the invididual actors
actors.names <- read.csv("/Users/erikchen/Desktop/Data Viz Programs/Policy Brief/Data Files/name.basics

# look at the column names of main file and movie ratings file
str(main.movie.file)
```

```
## 'data.frame':    1048575 obs. of  9 variables:
##  $ tconst        : Factor w/ 1048575 levels "tt0000001","tt0000002",..: 1 2 3 4 5 6 7 8 9 10 ...
##  $ titleType     : Factor w/ 10 levels "movie","short",..: 2 2 2 2 2 2 2 2 1 2 ...
##  $ primaryTitle  : Factor w/ 741621 levels "_grau","- Estrés + Chill",..: 103269 364906 471182 69332
##  $ originalTitle : Factor w/ 748043 levels "_grau","- Estrés + Chill",..: 102966 373426 482576 69819
##  $ isAdult       : int  0 0 0 0 0 0 0 0 0 0 ...
##  $ startYear     : Factor w/ 136 levels "\\N","1888","1889",..: 8 6 6 6 7 8 8 8 8 9 ...
##  $ endYear       : Factor w/ 80 levels "\\N","1933","1938",..: 1 1 1 1 1 1 1 1 1 1 ...
##  $ runtimeMinutes: Factor w/ 619 levels "\\N","0","1",..: 3 445 376 37 3 3 3 3 416 3 ...
##  $ genres        : Factor w/ 1728 levels "\\N","Action",..: 1192 673 576 673 966 1709 1710 1192 1681
```

```r
str(movies.ratings)
```

```
## 'data.frame':    1028136 obs. of  3 variables:
##  $ tconst       : Factor w/ 1028136 levels "tt0000001","tt0000002",..: 1 2 3 4 5 6 7 8 9 10 ...
##  $ averageRating: num  5.6 6.1 6.5 6.2 6.1 5.2 5.4 5.4 5.4 6.9 ...
##  $ numVotes     : int  1586 192 1249 119 2003 109 628 1721 88 5679 ...
```

```r
# merge main movie file and movie ratings file by $tconst values ($tconst is the unique identifier for
movies <- merge(x = main.movie.file, y = movies.ratings, by = "tconst", all = TRUE)
dim(movies)
```

```
## [1] 1638909      11
```

```r
summary(movies)
```

```
##        tconst            titleType            primaryTitle
##  tt0000001:      1   tvEpisode:503610   Episode #1.1:   2622
##  tt0000002:      1   movie    :232174   Episode #1.2:   2035
##  tt0000003:      1   short    :140788   Episode #1.3:   1950
##  tt0000004:      1   video    : 59053   Episode #1.4:   1855
##  tt0000005:      1   tvSeries : 45429   Episode #1.5:   1749
##  tt0000006:      1   (Other)  : 67521   (Other)     :1038364
##  (Other)  :1638903   NA's     :590334   NA's        : 590334
##       originalTitle        isAdult         startYear        endYear
##  Episode #1.1:   2622   Min.   :0        2006   : 64083   \\N    :1032789
##  Episode #1.2:   2035   1st Qu.:0        2005   : 61771   2004   :    687
##  Episode #1.3:   1950   Median :0        2004   : 52966   2005   :    675
##  Episode #1.4:   1855   Mean   :0        2003   : 43701   2003   :    599
##  Episode #1.5:   1749   3rd Qu.:0        2002   : 36468   2001   :    574
##  (Other)     :1038364   Max.   :1        (Other):789586   (Other):  13251
##  NA's        : 590334   NA's   :590334   NA's   :590334   NA's   : 590334
##  runtimeMinutes           genres       averageRating       numVotes
##  \\N    :530468   Drama      :104260   Min.   : 1.0     Min.   :      5.0
##  30     : 49679   Comedy     : 87448   1st Qu.: 6.1     1st Qu.:      8.0
##  60     : 38020   \\N        : 83850   Median : 7.1     Median :     19.0
##  90     : 21583   Documentary: 50441   Mean   : 6.9     Mean   :    947.9
##  22     : 13263   Short      : 37516   3rd Qu.: 7.9     3rd Qu.:     75.0
##  (Other):395562   (Other)    :685060   Max.   :10.0     Max.   :2192705.0
##  NA's   :590334   NA's       :590334   NA's   :610773   NA's   :610773
```

```r
# take out movies with no ratings
movies <- movies[which(!is.na(movies$averageRating) == TRUE),]
dim(movies)
```

```
## [1] 1028136      11
```

```r
# look at the column names of star actors file and actor names file
str(movies.staractor)
```

```
## 'data.frame':    1048575 obs. of  6 variables:
##  $ tconst    : Factor w/ 119704 levels "tt0000001","tt0000002",..: 1 1 1 2 2 3 3 3 3 4 ...
##  $ ordering  : int  1 2 3 1 2 1 2 3 4 1 ...
##  $ nconst    : Factor w/ 250045 levels "nm0000001","nm0000002",..: 225023 3835 87115 159661 220249 15
##  $ category  : Factor w/ 12 levels "actor","actress",..: 11 7 5 7 6 7 9 6 8 7 ...
##  $ job       : Factor w/ 11964 levels "'It All Came True'",..: 3 3 2053 3 3 3 9344 3 3 3 ...
##  $ characters: Factor w/ 307659 levels "[\"?\"]","[\". (Ep.: Ausflug in den Wald)\"]",..: 122219 307
```

```r
str(actors.names)
```

```
## 'data.frame':    1048575 obs. of  6 variables:
##  $ nconst           : Factor w/ 1048575 levels "nm0000001","nm0000002",..: 1 2 3 4 5 6 7 8 9 10 ...
##  $ primaryName      : Factor w/ 983789 levels ":Leif Sundberg",..: 300867 543781 118867 458184 384991
##  $ birthYear        : Factor w/ 373 levels "\\N","1130","1150",..: 254 279 289 304 273 270 254 279 28
##  $ deathYear        : Factor w/ 328 levels "\\N","1031","1191",..: 292 319 1 287 312 287 262 309 289
##  $ primaryProfession: Factor w/ 11618 levels "","actor","actor,actress",..: 9835 1289 1309 638 11362
##  $ knownForTitles   : Factor w/ 751903 levels "\\N","tt0000005",..: 119056 297351 74532 142592 66449
```

```r
# merge star actors file and actor names file by $nconst values ($nconst is the unique id for individua
actors.info <- merge(x = actors.names, y = movies.staractor, by = "nconst", all = TRUE)
dim(actors.info)
```

```
## [1] 1888030      11
```

```r
summary(actors.info)
```

```
##        nconst                primaryName       birthYear
##  nm0000305:    893   Mel Blanc     :    893   \\N    :905791
##  nm0784407:    762   Mack Sennett  :    762   1925   : 12413
##  nm0000428:    580   D.W. Griffith :    580   1908   : 12392
##  nm0005658:    527   G.W. Bitzer   :    527   1930   : 12266
##  nm0281487:    495   Dave Fleischer:    495   1892   : 12093
##  nm0293989:    466   (Other)       :1831632   (Other):879934
##  (Other)  :1884307   NA's          :  53141   NA's   : 53141
##   deathYear            primaryProfession
##  \\N    :1204272   actor        : 314565
##  1979   :   9889   actress      : 228790
##  1971   :   9500   writer       :  55299
##  1994   :   9500                :  52037
##  1989   :   9295   miscellaneous:  39173
##  (Other): 592433   (Other)      :1145025
##  NA's   :  53141   NA's         :  53141
##                                 knownForTitles           tconst
##  \\N                                   :  61405   tt0000376:     10
##  tt0094939,tt0045708,tt0096438,tt0077278:    893   tt0000439:     10
##  tt0023040,tt0012701,tt0229411,tt0018951:    762   tt0000488:     10
##  tt0004972,tt0006864,tt0009559,tt0010484:    580   tt0000557:     10
##  tt0249710,tt0322496,tt0431889,tt0004972:    527   tt0000574:     10
##  (Other)                               :1770722   (Other)  :1048525
##  NA's                                  :  53141   NA's     : 839455
##     ordering                category             job
##  Min.   : 1.0     actor          :318678   \\N       :845917
##  1st Qu.: 3.0     actress        :182400   producer  : 62973
##  Median : 5.0     writer         :163828   screenplay: 25643
##  Mean   : 5.2     director       :114275   story     : 18580
##  3rd Qu.: 8.0     cinematographer: 75592   writer    : 11445
##  Max.   :10.0     (Other)        :193802   (Other)   : 84017
##  NA's   :839455   NA's           :839455   NA's      :839455
##              characters
##  \\N               :588471
##  ["Himself"]       :  6782
##  ["Herself"]       :  2815
##  ["Narrator"]      :  1748
```

```
##  ["Himself - Host"]:   567
##  (Other)           :448192
##  NA's              :839455
```

```
# make new dataset with only relevant columns in movie names file, eliminate movies prior to 1970
movies <- movies[c(1:3, 6, 9:11)]
movies$startYear <- as.numeric(as.character(movies$startYear)) # convert the stateYear variable to a nu
```

```
## Warning: NAs introduced by coercion
```

```
str(movies) # look to see that conversion was successful
```

```
## 'data.frame':    1028136 obs. of  7 variables:
##  $ tconst       : Factor w/ 1638909 levels "tt0000001","tt0000002",..: 1 2 3 4 5 6 7 8 9 10 ...
##  $ titleType    : Factor w/ 10 levels "movie","short",..: 2 2 2 2 2 2 2 2 1 2 ...
##  $ primaryTitle : Factor w/ 741621 levels "_grau","- Estrés + Chill",..: 103269 364906 471182 693320
##  $ startYear    : num  1894 1892 1892 1892 1893 ...
##  $ genres       : Factor w/ 1728 levels "\\N","Action",..: 1192 673 576 673 966 1709 1710 1192 1681 1
##  $ averageRating: num  5.6 6.1 6.5 6.2 6.1 5.2 5.4 5.4 5.4 6.9 ...
##  $ numVotes     : int  1586 192 1249 119 2003 109 628 1721 88 5679 ...
```

```
movies.sub <- subset(movies, startYear >= 1970)
dim(movies.sub)
```

```
## [1] 338628      7
```

```
# make another new dataset with only relevant columns in actor info file, keep only relevant columns, p
actors.info <- actors.info[c(1:4, 7, 9, 11)]
actors.info$birthYear <- as.numeric(as.character(actors.info$birthYear))
```

```
## Warning: NAs introduced by coercion
```

```
actors.info.sub <- subset(actors.info, birthYear >= 1930 & (category == "actor" | category == "actress"
dim(actors.info.sub) # check to see if it worked
```

```
## [1] 176871      7
```

```
# merge sub-data sets
movies.by.actors <- merge(x = actors.info.sub, y = movies.sub, by = "tconst", all = TRUE )
movies.by.actors <- movies.by.actors[which(!is.na(movies.by.actors$primaryTitle) == TRUE),]
movies.by.actors <- movies.by.actors[which(!is.na(movies.by.actors$nconst) == TRUE),]
dim(movies.by.actors) # check to see if it worked
```

```
## [1] 140084     13
```

```
# filter out only Robert De Niro's filmography
robert.deniro.only <- filter(.data = movies.by.actors, primaryName == "Robert De Niro")
str(robert.deniro.only) #check to see if it's accurate
```

```
## 'data.frame':    41 obs. of  13 variables:
##  $ tconst       : Factor w/ 1638910 levels "tt0000001","tt0000002",..: 63966 67797 68387 69534 71989
##  $ nconst       : Factor w/ 1089500 levels "nm0000001","nm0000002",..: 134 134 134 134 134 134 134 13
##  $ primaryName  : Factor w/ 983789 levels ":Leif Sundberg",..: 793815 793815 793815 793815 793815 793
##  $ birthYear    : num  1943 1943 1943 1943 1943 ...
##  $ deathYear    : Factor w/ 328 levels "\\N","1031","1191",..: 1 1 1 1 1 1 1 1 1 1 ...
##  $ category     : Factor w/ 12 levels "actor","actress",..: 1 1 1 1 1 1 1 1 1 1 ...
##  $ characters   : Factor w/ 307659 levels "[\"?\"]","[\". (Ep.: Ausflug in den Wald)\"]",..: 149829 3
##  $ titleType    : Factor w/ 10 levels "movie","short",..: 1 1 1 1 1 1 1 1 1 1 ...
##  $ primaryTitle : Factor w/ 741621 levels "_grau","- Estrés + Chill",..: 284038 65983 404286 614375 4
##  $ startYear    : num  1970 1973 1973 1974 1976 ...
```

```
##  $ genres       : Factor w/ 1728 levels "\\N","Action",..: 830 1324 1010 994 1247 1306 994 1272 1332
##  $ averageRating: num  6.2 6.9 7.3 9 7.7 6.3 8.3 6.7 8.1 8.2 ...
##  $ numVotes     : int  4001 5143 91957 1058265 21149 7544 675223 17197 294832 302581 ...
```

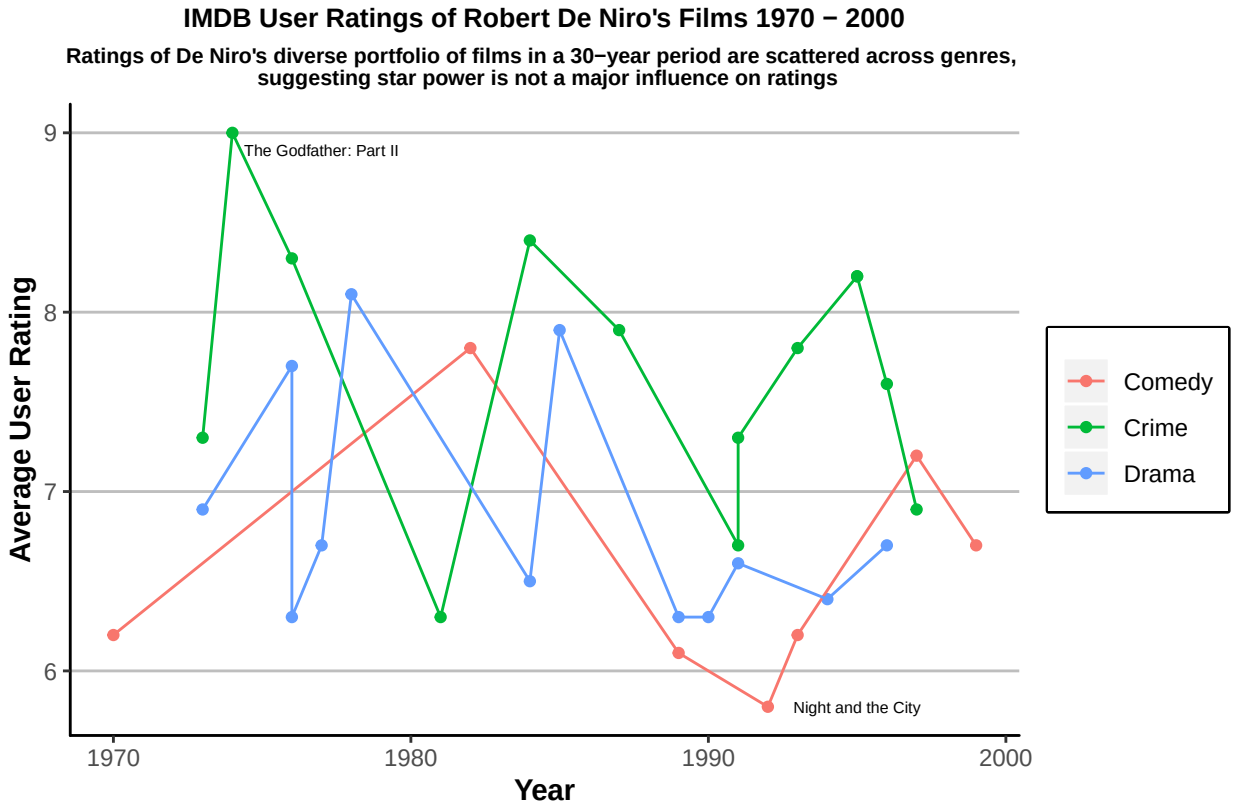
```
# single out the 1st listed genre category
robert.deniro.only$Genre <- gsub("^(.*?),.*", "\\1", robert.deniro.only$genres)
str(robert.deniro.only) # check to see if it worked
```

```
## 'data.frame':    41 obs. of  14 variables:
##  $ tconst       : Factor w/ 1638910 levels "tt0000001","tt0000002",..: 63966 67797 68387 69534 71989
##  $ nconst       : Factor w/ 1089500 levels "nm0000001","nm0000002",..: 134 134 134 134 134 134 134 13
##  $ primaryName  : Factor w/ 983789 levels ":Leif Sundberg",..: 793815 793815 793815 793815 793815 793
##  $ birthYear    : num  1943 1943 1943 1943 1943 ...
##  $ deathYear    : Factor w/ 328 levels "\\N","1031","1191",..: 1 1 1 1 1 1 1 1 1 1 ...
##  $ category     : Factor w/ 12 levels "actor","actress",..: 1 1 1 1 1 1 1 1 1 1 ...
##  $ characters   : Factor w/ 307659 levels "[\"?\"]","[\". (Ep.: Ausflug in den Wald)\"]",..: 149829 3
##  $ titleType    : Factor w/ 10 levels "movie","short",..: 1 1 1 1 1 1 1 1 1 1 ...
##  $ primaryTitle : Factor w/ 741621 levels "_grau","- Estrés + Chill",..: 284038 65983 404286 614375 4
##  $ startYear    : num  1970 1973 1973 1974 1976 ...
##  $ genres       : Factor w/ 1728 levels "\\N","Action",..: 830 1324 1010 994 1247 1306 994 1272 1332
##  $ averageRating: num  6.2 6.9 7.3 9 7.7 6.3 8.3 6.7 8.1 8.2 ...
##  $ numVotes     : int  4001 5143 91957 1058265 21149 7544 675223 17197 294832 302581 ...
##  $ Genre        : chr  "Comedy" "Drama" "Crime" "Crime" ...
```

```
# subset filmography to take out genres where De Niro has not consistently acted in throughout the 30-y
deniro.sub <- subset(robert.deniro.only, Genre != "Action" & Genre !="Adventure" & Genre != "Biography"

# plot graph, points and trace those points
deniro.chart <- ggplot(deniro.sub, aes(x = startYear, y = averageRating, color = Genre)) + geom_point()
                geom_path() +
                labs(title = "IMDB User Ratings of Robert De Niro's Films 1970 - 2000",
                     subtitle = "Ratings of De Niro's diverse portfolio of films in a 30-year period a
                     x = "Year", y = "Average User Rating", caption = "Source: IMDB") +
# add annotations to highest rated and lowest rated film
                  annotate("text", x = 1977, y = 8.9, label = "The Godfather: Part II", size = 2) +
                annotate("text", x = 1995, y = 5.8, label = "Night and the City", size = 2) +
# add themes to graph to make it aesthetically easy to look at, edit the gridlines & legend
                theme(panel.background = element_rect(fill = "white"),
                      panel.grid.major.y = element_line(color = "grey"),
                      panel.grid.major.x = element_blank(),
                      legend.box.background = element_rect(color = "black", fill = NA, size = 1),
                      legend.title = element_blank()) +
# add titles, stylize typeface
                theme(axis.line.x = element_line(color = "black", size = 0.5),
                    axis.line.y = element_line(color = "black", size = 0.5),
                    axis.title.x = element_text(face = "bold"),
                    axis.title.y = element_text(face = "bold"),
                    plot.title = element_text(hjust = 0.5, face = "bold", size = 10),
                    plot.subtitle = element_text(hjust = 0.5, face = "bold", size = 7.5),
                    plot.caption = element_text(hjust = 0))

deniro.chart
```


IMDB User Ratings of Robert De Niro's Films 1970 − 2000
Ratings of De Niro's diverse portfolio of films in a 30−year period are scattered across genres, suggesting star power is not a major influence on ratings
Average User Rating
9
8
7
6
The Godfather: Part II
Night and the City
1970
1980
1990
2000
Year
Comedy
Crime
Drama

Source: IMDB