```
In [1]: #library lubridate for manipulate date
          #library ggplot2 for plot
          #library dplyr for manipulate data
          #library plyr for manipulate data
          #library forecast for forecaste
          #library plotly for plot
          #library glmnet for multiple regression
          library("lubridate")
          library("ggplot2")
          library("dplyr")
          library("plyr")
          library("plotly")
          library("mlbench")
          library("glmnet")
          library("stringr")
          Attaching package: 'lubridate'
          The following object is masked from 'package:base':
               date
          Registered S3 methods overwritten by 'ggplot2':
             method
                             from
            [.quosures
                              rlang
            c.quosures
                             rlang
             print.quosures rlang
          Attaching package: 'dplyr'
          The following objects are masked from 'package:lubridate':
               intersect, setdiff, union
          The following objects are masked from 'package:stats':
               filter, lag
          The following objects are masked from 'package:base':
               intersect, setdiff, setequal, union
          You have loaded plyr after dplyr - this is likely to cause problems.
          If you need functions from both plyr and dplyr, please load plyr first, then dplyr:
          library(plyr); library(dplyr)
          Attaching package: 'plyr'
          The following objects are masked from 'package:dplyr':
               arrange, count, desc, failwith, id, mutate, rename, summarise,
               summarize
          The following object is masked from 'package:lubridate':
               here
          Attaching package: 'plotly'
          The following objects are masked from 'package:plyr':
               arrange, mutate, rename, summarise
          The following object is masked from 'package:ggplot2':
               last_plot
          The following object is masked from 'package:stats':
               filter
          The following object is masked from 'package:graphics':
          Loading required package: Matrix
          Loading required package: foreach
          Loaded glmnet 2.0-16
 In [2]: #Load data
           x<- "C:/Users/jessi/OneDrive/Desktop/ALY 6070/Final Project/D24 MAB FY19P1to7.csv"
          df <- read.csv(file = x)</pre>
          df
           MBWHSE MBREG_NUM MBTRN_NUM FISCAL_PERIOD
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 In [3]: str(df)
                            832766 obs. of 26 variables:
           'data.frame':
           $ MBWHSE
                            : int 423 770 770 770 29 1070 113 126 126 466 ...
           $ MBREG_NUM
                            : int 12 2 2 51 9 4 8 51 82 11 ...
           $ MBTRN_NUM
                            : int 398 108 209 52 482 410 170 40 88 79 ...
           $ FISCAL_PERIOD: int 2 2 2 2 2 2 2 2 2 2 ...
           $ MBDATE
                            : Factor w/ 196 levels "1/1/2019 0:00",..: 50 50 50 50 50 33 33 33 33 ...
           $ MBTIME
                            : int 1721 1226 1442 1458 1908 1827 1341 1321 1317 1152 ...
           $ MBITEM
                            : int 1234449 1235362 1238985 1238985 1275609 1235362 1234449 1181376 1235362 1235362 ...
           $ MBDSUN
                            : int 111-11111-11...
           $ MBDSEL
                            : num 550 470 900 -900 800 ...
           $ MBRESL
                            : Factor w/ 3 levels "", "N", "Y": 1 1 1 1 1 1 1 1 1 1 ...
                            : Factor w/ 2 levels "", "Y": 1 1 1 1 1 1 1 1 2 1 ...
           $ MBRFND
           $ IMCAT1
                            : Factor w/ 1 level "M": 1 1 1 1 1 1 1 1 1 ...
           $ IMCAT2
                            : Factor w/ 1 level "A": 1 1 1 1 1 1 1 1 1 ...
           $ IMCAT3
                            : Factor w/ 1 level "B": 1 1 1 1 1 1 1 1 1 1 ...
           $ Category
                            : Factor w/ 1 level "MAB": 1 1 1 1 1 1 1 1 1 ...
           $ IMDES1
                            : Factor w/ 526 levels "ACER A5 LAPTOP",...: 286 183 287 287 281 183 286 284 183 183 ...
                            : Factor w/ 517 levels "","-S11553 C.2.40GHZ W/15\"",..: 365 334 420 420 462 334 365 366 334 334 ...
           $ IMDES2
                            : Factor w/ 10 levels "BA", "BD", "EC", ...: 1 7 7 7 1 6 7 4 4 8 ...
           $ REGION
                            : Factor w/ 5 levels "D1", "D2", "D3", ...: 3 1 1 1 2 1 1 3 3 2 ....
           $ LCDIST
                            : Factor w/ 532 levels "Albany", "Albuquerque",..: 449 431 431 431 384 374 396 163 163 363 ...
           $ LCNAME
                            : Factor w/ 467 levels "ALBANY", "ALBUQUERQUE", ..: 404 299 299 299 345 336 355 143 143 328 ...
: Factor w/ 46 levels "AK", "AL", "AZ", ..: 4 42 42 42 4 32 42 4 4 3 ...
           $ LCCITY
           $ LCSTA
           $ MSPIPK
                            : int 539928 6142209 6139758 6139758 826806 1108808 1880080 4777114 4777114 2040083 ...
           $ ACCTYP
                            : int 111111111...
           $ EXECFLG
                            : Factor w/ 2 levels "", "E": 2 2 1 1 1 1 2 2 2 1 ...
           $ Label
                            : Factor w/ 27 levels "ACER", "ALIENWARE", ...: 11 8 11 11 11 8 11 11 8 8 ...
 In [4]: #Edit Date Time
           df$date_only<-sapply(as.character(df$MBDATE), FUN = function(x) {strsplit(x, split = '[ ]')[[1]][1]})</pre>
          # create month and year variables
          df$month <- sapply(df$date_only, FUN = function(x) {strsplit(x, split = '[/]')[[1]][1]})</pre>
          df$year <- sapply(df$date_only, FUN = function(x) {strsplit(x, split = '[/]')[[1]][3]})</pre>
 In [5]: #adjust date formate
           df$date_only <- as.Date(df$date_only, "%m/%d/%Y")</pre>
          df$dayOfWeek <- wday(df$date, label=TRUE)</pre>
In [6]: df$week<-week(df$date)</pre>
           df$month<-month(ymd(df$date_only),label=FALSE, abbr=FALSE)</pre>
 In [8]: # aggregate by Transaction Number
          df_new<-df%>%
               group_by(MSPIPK,MBITEM) %>%
               select(MBWHSE, MBREG_NUM, MBTRN_NUM, FISCAL_PERIOD, date_only, year, month, week, dayOfWeek, MBDSUN, MBDSEL,
                       MBITEM, MBITEM, MSPIPK, ACCTYP)
           head(df_new)
           MBWHSE MBREG_NUM MBTRN_NUM FISCAL_PERIOD date_only year month week dayOfWeek MBDSUN MBDSEL MBITEM MSPIPK ACCTYP
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In [10]: ##Revenue details by Day of week
           weekdaydetail <- df %>%
             group_by(date_only, dayOfWeek) %>%
             summarise(revenue = sum(MBDSEL), transactions = n_distinct(MBTRN_NUM)) %>%
             mutate(aveOrd = (round((revenue / transactions),2))) %>%
             arrange(date_only) %>%
             ungroup()
           weekdaydetail
            date_only dayOfWeek
                                  revenue transactions aveOrd
                                                  82 813.16
           2018-09-03
                           Mon
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                                                1390 1550.28
           2019-03-02
                                  1901779
                                                 565 3365.98
                           Sat
           2019-03-03
                                  3033659
                                                1922 1578.39
                           Sun
           2019-03-04
                                  2335302
                                                2069 1128.71
                           Mon
                                                1589 1338.99
           2019-03-05
                           Tue
                                  2127655
           2019-03-06
                           Wed
                                  1760273
                                                1581 1113.39
           2019-03-07
                                  3301932
                                                1880 1756.35
                           Thu
           2019-03-08
                            Fri
                                  1909867
                                                1614 1183.31
           2019-03-09
                                  1376365
                                                 544 2530.08
                           Sat
           2019-03-10
                                  2179599
                                                1507 1446.32
                           Sun
           2019-03-11
                           Mon
                                  1976904
                                                1918 1030.71
           2019-03-12
                           Tue
                                  1611708
                                                1514 1064.54
                                                1508 1527.84
           2019-03-13
                           Wed
                                  2303984
           2019-03-14
                           Thu
                                  2708674
                                                1619 1673.05
           2019-03-15
                                  2271723
                                                1558 1458.10
           2019-03-16
                           Sat
                                  1493079
                                                 533 2801.27
           2019-03-17
                                  2397569
                                                1612 1487.33
                           Sun
In [11]: #corelation between transactions and revenue
           ggplot(weekdaydetail, aes(x=revenue/1000000, y=transactions,color=dayOfWeek))+ geom_point()+
           ggtitle("Revenue by day of week")+theme_bw() + xlab("Revenue") + ylab("Transactions")+
          theme (plot.title = element_text(size = 12))
                     Revenue by day of week
               15000
```

Sun

Mon

Tue

Wed

Thu

Fri

Sat

In []: #export manipulated file
write.csv(df, "C:/Users/jessi/OneDrive/Desktop/ALY 6070/Final Project/SalesFY19P1to7.csv")

100000