Saleem_Burhani_-*Karachi*-_assignment-2.R

biuser

Mon Mar 27 18:01:33 2017

```
# R Assignment 2
# 22 March 2017
# Completed 27 march 2017
# Saleem Burhani

# load libraries
library(swirl)

##
## | Hi! Type swirl() when you are ready to begin.

#onetime usage
#swirl::install_course("Getting and Cleaning Data")
#library(datasets)
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

#library(sparklyr)
#library(tidyr)
library(lubridate)

##
## Attaching package: 'lubridate'

## The following object is masked from 'package:base':
##
##     date

library(ggplot2)
library(stringr)

# load dataset
path2csv = "C:\\Users\\biuser\\Desktop\\DIH\\22mar17-R&P\\hospitaldata.csv"
```

```
mydfCSV <- read.csv(path2csv,stringsAsFactors=FALSE)
```

```
"Task ........1"
```

```
## [1] "Task ........1"
```

```
"Please remove the dots in the names, so it may become easier for you to work
through it."
```

```
## [1] "Please remove the dots in the names, so it may become easier for you
to work through it."
```

```
" "
```

```
## [1] " "
```

```
# Name column is
mydfcolnames <- colnames(mydfCSV)
mydfcolnames <- gsub(".."," ",mydfcolnames,fixed=TRUE)
mydfcolnames <- gsub("."," ",mydfcolnames,fixed=TRUE)
colnames(mydfCSV) <- mydfcolnames
head(mydfCSV)
```

```
##                       Date  id    Time Age Sex Consulting Doctor
## 1 Sunday, January 01, 2017 101   11:00  40   F     Dr Kinza Alam
## 2 Monday, January 02, 2017 150 10:45AM  26   M     Nursing Staff
## 3 Monday, January 02, 2017  58 12:38PM  30   F  Dr Riffat Naheed
## 4 Monday, January 02, 2017  75  1:00PM  40   M  Dr Riffat Naheed
## 5 Monday, January 02, 2017  97  2:45PM  27   M  Dr Riffat Naheed
## 6 Monday, January 02, 2017 101  3:00PM  40   F     Dr Kinza Alam
##         Specialty    Procedure Total Charges Amount Received
## 1           Gynae    C Section         30000            30000
## 2                     Dressing          1500             1500
## 3 Psychotherapist Consultation          1000             1000
## 4 Psychotherapist Consultation          1500             1500
## 5 Psychotherapist Consultation          2000             2000
## 6           Gynae    C Section         35000            35000
##   Amount Balance Amount Received By Amount in Hospital Receptionist Name
## 1              -          Mrs Shamsa                  NA            Hamza
## 2              -           Dr Saniya                  NA            Haris
## 3              -          Mrs Shamsa                 300             Fiza
## 4              -          Mrs Shamsa                 450           Zaheer
## 5              -          Mrs Shamsa                 600            Haris
## 6              -           Dr Saniya                  NA            Haris
##   Next Apt
## 1
## 2
## 3
## 4
```

```
## 5
## 6

# Remove all "Nursing Staff" records which are not required
mydf <- filter(mydfCSV,mydfCSV$`Consulting Doctor` != "Nursing Staff")

"Task 2"

## [1] "Task 2"

"Which day of the week is expected to have most visits?"

## [1] "Which day of the week is expected to have most visits?"

" "

## [1] " "

# create column have week day
mydf <- mutate(mydf,Week_Day = substr(mydf$Date,0,str_locate(mydf$Date,",")-
1))
# count records group by week_day
patient_by_week_day <- aggregate(rep(1,
length(mydf$Week_Day)),by=list(mydf$Week_Day), sum)
# get the day having max records
max_patient_in_a_week_day <- max(patient_by_week_day$x, na.rm = TRUE)
filter(patient_by_week_day, x == max_patient_in_a_week_day)

##   Group.1  x
## 1  Monday 47

"Task 3"

## [1] "Task 3"

"What is the average age of patients?"

## [1] "What is the average age of patients?"

" "

## [1] " "

newdf <- mydf
newdf$age <- as.numeric(mydf$Age, na.rm=TRUE)

## Warning: NAs introduced by coercion

mean(newdf$age, na.rm=TRUE)

## [1] 33.37126

"Task 4"
```

```
## [1] "Task 4"
```

```
"How many children were entertained? (Make a Bracket of Age from 1-12)"
```

```
## [1] "How many children were entertained? (Make a Bracket of Age from 1-
12)"
```

```
" "
```

```
## [1] " "
```

```
newdf <- mutate(newdf, adult_child = ifelse (age>=1 &
age<=12,"Child","Adult"))
count(newdf,adult_child)
```

```
## # A tibble: 3 × 2
##   adult_child     n
##         <chr> <int>
## 1       Adult   152
## 2       Child    15
## 3        <NA>    14
```

```
"Task 5"
```

```
## [1] "Task 5"
```

```
"Which gender type had what kind of procedure in abundance? i.e. Female visit mostly because of Gynae Problem"
```

```
## [1] "Which gender type had what kind of procedure in abundance? i.e.
Female visit mostly because of Gynae Problem"
```

```
" "
```

```
## [1] " "
```

```
#filter(newdf, Sex == "M")
temp <- count(newdf,Sex,Specialty,sort=TRUE)
tempM <- filter(temp,Sex == "M")
tempF <- filter(temp,Sex == "F")
tempM[1,]
```

```
## Source: local data frame [1 x 3]
## Groups: Sex [1]
##
##     Sex Specialty     n
##   <chr>     <chr> <int>
## 1     M   Dentist    46
```

```
tempF[1,]
```

```
## Source: local data frame [1 x 3]
## Groups: Sex [1]
```

```
##
##     Sex Specialty     n
##   <chr>     <chr> <int>
## 1     F   Dentist    56
```

```
#max(tempM$n, na.rm=TRUE)
#max(temp$n, na.rm = TRUE)
```

```
"Task 6"
```

```
## [1] "Task 6"
```

```
"Which Doctor is earning highest?"
```

```
## [1] "Which Doctor is earning highest?"
```

```
" "
```

```
## [1] " "
```

```
newdf$`Amount Received ` <- as.numeric(mydf$`Amount Received `, na.rm=TRUE)
doctors <- aggregate(newdf$`Amount Received `,
by=list(Doctor=newdf$`Consulting Doctor`), FUN=sum)
filter(doctors, x == max(doctors$x, na.rm=TRUE))
```

```
##          Doctor     x
## 1 Dr Kinza Alam 76700
```

```
"Task 7"
```

```
## [1] "Task 7"
```

```
"Which procedure type earns more money?"
```

```
## [1] "Which procedure type earns more money?"
```

```
" "
```

```
## [1] " "
```

```
Procedures <- aggregate(newdf$`Amount Received `,
by=list(Procedures=newdf$Procedure), FUN=sum)
filter(Procedures, x == max(Procedures$x, na.rm=TRUE))
```

```
##   Procedures     x
## 1  C Section 65000
```

```
"Task 8"
```

```
## [1] "Task 8"
```

```
"Which time of the day has highest frequency of visits by hour?"
```

```
## [1] "Which time of the day has highest frequency of visits by hour?"
```

```
" "

## [1] " "

# Correct HH:MM:SS XM"
Times <- newdf$Time
Times <- gsub("AM",":00 AM",Times,fixed=TRUE)
Times <- gsub("PM",":00 PM",Times,fixed=TRUE)
for (i in 1:NROW(Times)){
  if ((is.na(Times))==FALSE){
  if (substr(Times,6,6) == "") {
    Times[i] = paste(Times[i],":00 AM",sep ="")
  }
  }# is.na
}

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```

```
# add new column with all NA
newdf <- mutate(newdf,time24 = hm(Time))
# add 12 hours to PM value and update the new mutated column
Times2 = 0
Times2 <- hms(Times, na.rm=TRUE)
for (i in 1:NROW(newdf)){
  if (grepl("P", Times[i])==TRUE){
   Times2[i] <- hms(Times[i]) + hours(12)
   #cntPM = cntPM + 1
  }
  if (grepl("A", Times[i])==TRUE){
    Times2[i] <- hms(Times[i])
    #cntAM = cntAM +1
  }
  # Update value in data fram
  newdf$time24[i] = Times2[i]
}
cnt = count(newdf,hour(time24),sort=TRUE)
cnt[1,]
```

```
## # A tibble: 1 × 2
##   `hour(time24)`     n
##            <dbl> <int>
## 1             13    29
```

```
"Task 9"
```

```
## [1] "Task 9"
```

```
"Create a bracket of time by Morning, Afternoon, Evening, Night (6am - 12pm - Morning, 12 pm- 4 pm, Afternoon, 4 pm- 7pm, Evening, 7pm - 6 am, Night)."
```

```
## [1] "Create a bracket of time by Morning, Afternoon, Evening, Night (6am - 12pm - Morning, 12 pm- 4 pm, Afternoon, 4 pm- 7pm, Evening, 7pm - 6 am, Night)."
```

```
" "
```

```
## [1] " "
```

```
newdf <- mutate(newdf,TimeBracket = Time)
#TB <- newdf$TimeBracket
for (i in 1:NROW(newdf)){
  if ((is.na(newdf$time24[i]))==FALSE){
    newdf$TimeBracket[i] = paste("NA")
  # Morning
  if ((hour(newdf$time24[i]) >= 6)==TRUE){
    if ((hour(newdf$time24[i]) < 12)==TRUE){
      newdf$TimeBracket[i] = paste("Morning")
    }
  }
  # Afternoon
  if ((hour(newdf$time24[i]) >= 12)==TRUE){
    if ((hour(newdf$time24[i]) < 16 )==TRUE){
      newdf$TimeBracket[i] = paste("Afternoon")
    }
  }
  # Evening
  if ((hour(newdf$time24[i]) >= 16)==TRUE){
    if ((hour(newdf$time24[i]) < 19 )==TRUE){
      newdf$TimeBracket[i] = paste("Evening")
    }
  }
  # Night
  if ((hour(newdf$time24[i]) >= 19)==TRUE){
    if ((hour(newdf$time24[i]) < 6 )==TRUE){
      newdf$TimeBracket[i] = paste("Night")
    }
  }
  }# master false
}
# Display Time Bracket
newdf$TimeBracket
```

```
##   [1] "Morning"   "NA"        "Afternoon" "Afternoon" "Afternoon"
##   [6] "Afternoon" "Afternoon" "Afternoon" "Evening"   "Evening"
##  [11] "Evening"   "Afternoon" "Afternoon" "Evening"   "NA"
##  [16] "NA"        "NA"        "NA"        "NA"        "Afternoon"
##  [21] "Afternoon" "NA"        "Afternoon" "Afternoon" "-"
##  [26] "NA"        "NA"        "Afternoon" "Afternoon" "Afternoon"
```

```
##  [31] "Evening"   "Evening"   "Afternoon" "Evening"   ""
##  [36] "Afternoon" "Evening"   "Evening"   "Morning"   "Afternoon"
##  [41] "Afternoon" "Morning"   "Afternoon" "NA"        "Evening"
##  [46] "Evening"   "Afternoon" "Evening"   "Evening"   "Morning"
##  [51] "Morning"   "Afternoon" "Afternoon" "Evening"   "NA"
##  [56] "NA"        "Afternoon" "Evening"   "Morning"   "Morning"
##  [61] "Afternoon" "Afternoon" "NA"        "Afternoon" "Afternoon"
##  [66] "Evening"   "Afternoon" "Afternoon" "Afternoon" "Afternoon"
##  [71] "NA"        "Afternoon" "Evening"   ""          "Evening"
##  [76] "Afternoon" "Afternoon" "Evening"   "Evening"   "Evening"
##  [81] "Evening"   "Evening"   "Evening"   "Afternoon" "Afternoon"
##  [86] "Afternoon" "Afternoon" "Evening"   "NA"        "Afternoon"
##  [91] "Afternoon" "Evening"   "NA"        "Evening"   "Evening"
##  [96] "NA"        "NA"        "Afternoon" "Afternoon" "Evening"
## [101] "Evening"   "NA"        "Afternoon" "Afternoon" "Evening"
## [106] "NA"        "Morning"   "NA"        "NA"        "Afternoon"
## [111] "Afternoon" "Afternoon" "Morning"   "Morning"   "NA"
## [116] "NA"        "Evening"   "Evening"   "Evening"   "NA"
## [121] "NA"        "Morning"   "Afternoon" "NA"        ""
## [126] "Afternoon" "NA"        "Morning"   "Evening"   "Evening"
## [131] "Evening"   "Evening"   "Evening"   "Evening"   "Afternoon"
## [136] ""          "Afternoon" "Afternoon" "NA"        "Afternoon"
## [141] "Evening"   "NA"        "Afternoon" "Evening"   "Evening"
## [146] "Afternoon" "Afternoon" "Afternoon" "Afternoon" "NA"
## [151] "Afternoon" "Evening"   "Morning"   "NA"        "-"
## [156] "NA"        ""          "Afternoon" "Evening"   "Evening"
## [161] "NA"        "NA"        "NA"        "NA"        "Morning"
## [166] "NA"        "Afternoon" "Evening"   "Afternoon" "Afternoon"
## [171] "Evening"   "-"         "Afternoon" "-"         "Evening"
## [176] "Evening"   "NA"        "NA"        "Afternoon" "Evening"
## [181] "NA"
```

```
"Task 10"
```

```
## [1] "Task 10"
```

```
"How many patients are repeated visitors?"
```

```
## [1] "How many patients are repeated visitors?"
```

```
" "
```

```
## [1] " "
```

```
# ID is patient
cnt = count(newdf,id,sort=TRUE)
count(cnt)
```

```
## # A tibble: 1 × 1
##      nn
##   <int>
## 1   141
```

```
"Task 11"
```

```
## [1] "Task 11"
```

```
"Give us the id of repeated visitors."
```

```
## [1] "Give us the id of repeated visitors."
```

```
" "
```

```
## [1] " "
```

```
cnt = count(newdf,id,sort=TRUE)
filter (cnt, cnt$n > 1)
```

```
## # A tibble: 29 × 2
##       id     n
##    <int> <int>
## 1     17     4
## 2    140     4
## 3     45     3
## 4     63     3
## 5    101     3
## 6    109     3
## 7    114     3
## 8    132     3
## 9    145     3
## 10    12     2
## # ... with 19 more rows
```

```
"Task 12"
```

```
## [1] "Task 12"
```

```
"Which patients visited again for the same problem?"
```

```
## [1] "Which patients visited again for the same problem?"
```

```
" "
```

```
## [1] " "
```

```
cnt = count(newdf,id,Specialty,sort=TRUE)
cnt = filter (cnt, n > 1)
cnt
```

```
## Source: local data frame [25 x 3]
## Groups: id [25]
##
##       id  Specialty     n
##    <int>      <chr> <int>
## 1    140    Dentist     4
## 2     45    Dentist     3
```

```
## 3    101      Gynae     3
## 4    109    Dentist     3
## 5    114      Gynae     3
## 6    132    Dentist     3
## 7    145    Dentist     3
## 8     12    Dentist     2
## 9     13 Orthopedic     2
## 10    17    Dentist     2
## # ... with 15 more rows
```

```
"Task 13"
```

```
## [1] "Task 13"
```

```
"What is the median age for Females and Males?"
```

```
## [1] "What is the median age for Females and Males?"
```

```
" "
```

```
## [1] " "
```

```
newdfMale <- filter(newdf,Sex == "M")
"Average Male Age"
```

```
## [1] "Average Male Age"
```

```
mean(newdfMale$age,na.rm=TRUE)
```

```
## [1] 32.39474
```

```
newdfFemale <- filter(newdf,Sex == "F")
"Average Female Age"
```

```
## [1] "Average Female Age"
```

```
mean(newdfFemale$age,na.rm=TRUE)
```

```
## [1] 33.92222
```

```
"Task 14"
```

```
## [1] "Task 14"
```

```
"What is the total amount in balance"
```

```
## [1] "What is the total amount in balance"
```

```
" "
```

```
## [1] " "
```

```
# Remove comma before converting to numeric
#newdf$`Amount Balance` <- mydf$`Amount Balance`
```

```
newdf$`Amount Balance` <- gsub(",","",newdf$`Amount Balance`,fixed=TRUE)
newdf$`Amount Balance` <- as.numeric(newdf$`Amount Balance`, na.rm=TRUE)
```

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

```
"Total Amount Balance :"
```

```
## [1] "Total Amount Balance :"
```

```
sum(newdf$`Amount Balance`,na.rm=TRUE)
```

```
## [1] 222500
```

```
"Task 15"
```

```
## [1] "Task 15"
```

```
"How much money was made by Procedure Type 'Consultation'"
```

```
## [1] "How much money was made by Procedure Type 'Consultation'"
```

```
" "
```

```
## [1] " "
```

```
newdf$`Amount Received ` <- as.numeric(newdf$`Amount Received `, na.rm=TRUE)
"Revenue Generated By Procedure : Consultation "
```

```
## [1] "Revenue Generated By Procedure : Consultation "
```

```
sum(newdf$`Amount Balance`,newdf$Procedure=='Consultation', na.rm=TRUE)
```

```
## [1] 222583
```

```
"Task 16"
```

```
## [1] "Task 16"
```

```
"Is there a relation between Age and Total Charges paid?"
```

```
## [1] "Is there a relation between Age and Total Charges paid?"
```

```
" "
```

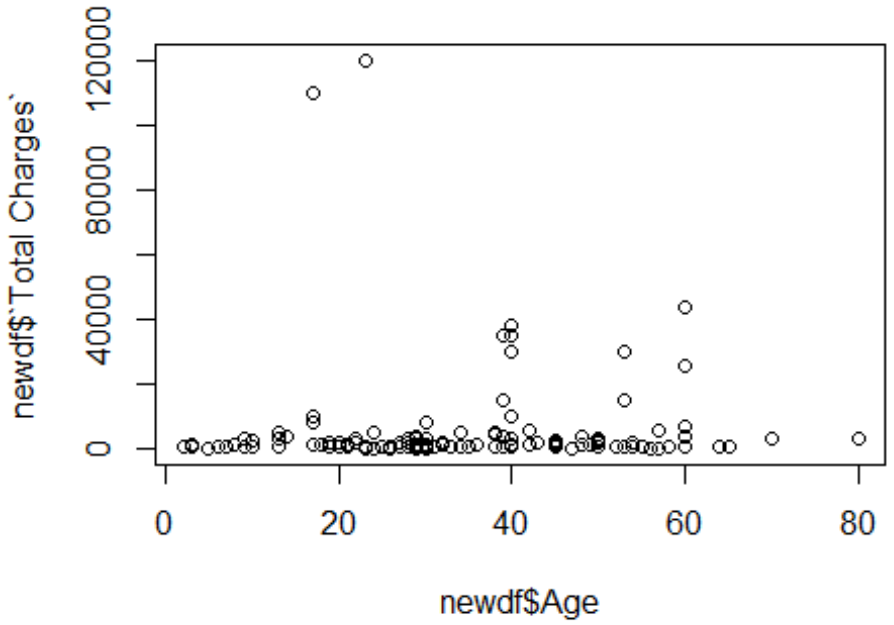
```
## [1] " "
```

```
newdf$`Total Charges` <- gsub(",","",newdf$`Total Charges`,fixed=TRUE)
newdf$`Total Charges` <- as.numeric(newdf$`Total Charges`, na.rm=TRUE)
```

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

```
plot(newdf$Age, newdf$`Total Charges`)
```

```
## Warning in xy.coords(x, y, xlabel, ylabel, log): NAs introduced by
coercion
```




```
#ggplot(data=newdf, aes(x=Age, y=`Total Charges`)) + theme_bw() + geom_line()
#+ facet_wrap(~ variable)


"Task 17"

## [1] "Task 17"

"Which Age group had highest number of visits?"

## [1] "Which Age group had highest number of visits?"

" "

## [1] " "

"Age Group and Number of Visits"

## [1] "Age Group and Number of Visits"

count(newdf,adult_child,sort=TRUE)

## # A tibble: 3 × 2
##   adult_child     n
##         <chr> <int>
## 1       Adult   152
## 2       Child    15
## 3        <NA>    14
```

```
"Task 18"
```

```
## [1] "Task 18"
```

```
"What is the total cost earned by Procedure Type X Ray and Scalling
together?"
```

```
## [1] "What is the total cost earned by Procedure Type X Ray and Scalling
together?"
```

```
" "
```

```
## [1] " "
```

```
newdf$`Total Charges` <- gsub(",","",newdf$`Total Charges`,fixed=TRUE)
newdf$`Total Charges` <- as.numeric(newdf$`Total Charges`, na.rm=TRUE)
"Total Cost Earned By Procedures 'X Ray' and 'Scalling' :"
```

```
## [1] "Total Cost Earned By Procedures 'X Ray' and 'Scalling' :"
```

```
sum(newdf$`Total Charges`,newdf$Procedure=='X Ray', na.rm=TRUE) +
sum(newdf$`Total Charges`,newdf$Procedure=='Scalling', na.rm=TRUE)
```

```
## [1] 1554418
```

```
"Finaly Write the clean data set"
```

```
## [1] "Finaly Write the clean data set"
```

```
# load dataset
#path2csv = "C:\\Users\\biuser\\Desktop\\DIH\\22mar17-R&P\\hospitaldata.csv"
write.csv(newdf, file = "C:\\Users\\biuser\\Desktop\\DIH\\22mar17-R&P\\clean-
data.csv")
```

```
" *** END ***"
```

```
## [1] " *** END ***"
```