May 2019 ACR

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3 June 2019

Contents

Libraries

```
library(lubridate)
```

```
##
## Attaching package: 'lubridate'
```

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

Data

Variables used

```
month <- "May"                                          # update line 208
year <- 2019
```

Read Data In

The data is a CSV file that is created by saving the ACR tab of the FPA Excel Workbook.

```
ACR <- read.csv(file = "./data/ACR.csv",
                stringsAsFactors = FALSE)
name <- c("SQA",
          "Application",
          "CRNumber",
          "CRDate",
          "CRApproved",
          "IENumber",
          "IEDate",
          "IEApproved",
          "Reason",
          "Comments")
names(ACR) <- name
rm(name)
```

Format the Data

Convert to Factor

```
ACR$SQA <- as.factor(ACR$SQA)
ACR$Application <- as.factor(ACR$Application)
ACR$CRApproved <- as.factor(ACR$CRApproved)
ACR$IEApproved <- as.factor(ACR$IEApproved)
levels(ACR$IEApproved)[1] <- NA
ACR$Reason <- as.factor(ACR$Reason)
levels(ACR$Reason)[1] <- NA
```

Convert to Dates

```
ACR$CRDate <- as.Date(ACR$CRDate, format = "%d-%b-%y")
ACR$IEDate<- as.Date(ACR$IEDate, format = "%d-%b-%y")
ACR$CRmonth <- lubridate::month(ACR$CRDate, label = TRUE)
ACR$CRyear <- lubridate::year(ACR$CRDate)
ACR$IEmonth <- lubridate::month(ACR$IEDate, label = TRUE)
ACR$IEyear <- lubridate::year(ACR$IEDate)
```

Structure of The Data

```
str(ACR)
```

```
## 'data.frame':    596 obs. of  14 variables:
##  $ SQA        : Factor w/ 6 levels "Beilah","Liz",..: 3 3 3 6 6 2 2 3 3 6 ...
##  $ Application: Factor w/ 23 levels "ADDCOM","AFMS",..: 5 5 5 11 11 11 11 5 2 11 ...
```

```
##  $ CRNumber   : chr  "CSIT0824" "CSIT07991" "CSIT08209" "17-23207" ...
##  $ CRDate     : Date, format: "2016-08-15" "2016-11-30" ...
##  $ CRApproved : Factor w/ 4 levels "","A","A-FP",..: 2 2 2 3 3 3 3 2 2 3 ...
##  $ IENumber   : chr  "CSIT0824" "CSIT07991" "CSIT08209" "17-29297" ...
##  $ IEDate     : Date, format: "2018-10-08" "2018-10-08" ...
##  $ IEApproved : Factor w/ 3 levels "A","A-FP","D": 1 1 1 2 2 2 2 1 2 2 ...
##  $ Reason     : Factor w/ 9 levels "Inaccurate information",..: NA NA NA NA NA NA NA NA NA NA ...
##  $ Comments   : chr  "" "Cancellation" "" "I&E by Nick" ...
##  $ CRmonth    : Ord.factor w/ 12 levels "Jan"<"Feb"<"Mar"<..: 8 11 3 8 8 8 8 10 12 4 ...
##  $ CRyear     : num  2016 2016 2017 2017 2017 ...
##  $ IEmonth    : Ord.factor w/ 12 levels "Jan"<"Feb"<"Mar"<..: 10 10 10 1 1 1 1 10 1 1 ...
##  $ IEyear     : num  2018 2018 2018 2019 2019 ...
```

Metrics

Select Data

Data is selected first for the Month and Year of interest. The selection is based on boththe CR and I&E dates. This selelction is used as a master dataframe. Two additional dataframes are prduced the first of the approval of the CR inthe month and the second for the approval of the I&E in the month.

```
#create master dataframe
work <- subset(ACR,
               subset = (CRmonth == month & CRyear == year) |
                    (subset = IEmonth == month & IEyear == year))
# Create the CR data fram
workCR <- subset(ACR,
               subset = CRmonth == month & CRyear == year)
# create the IE data frame.
workIE <- subset(ACR,
               subset = IEmonth == month & IEyear == year)
```

Counts

Data Changes (CR) Request Approved

```
nrow(subset(workCR,
            subset = (CRApproved == "A" | CRApproved == "A-FP"))) -
  nrow(subset(workCR,
            subset = (IEApproved == "D")))
```

```
## [1] 76
```

Data Change Request Disapproved

```
nrow(subset(workCR,
            subset = (CRApproved == "D")))
```

```
## [1] 8
```

Implementation and Effectivity (IE) Approved

```
nrow(subset(workIE,
            subset = (IEApproved == "A" | IEApproved == "A-FP")))
```

```
## [1] 56
```

IE Disapproved

```
nrow(subset(workIE,
            subset = (CRApproved == "D")))
```

```
## [1] 0
```

First pass acceptance

CR

```
nrow(subset(workCR,
            subset = CRApproved == "A-FP")) /
     nrow(workCR) * 100
```

```
## [1] 82.35294
```

IE

```
nrow(subset(workIE,
            subset = IEApproved == "A-FP")) /
     nrow(workIE) * 100
```

```
## [1] 84.375
```

Total Process

This is the number of data changes that had both the CR and IE approved on first pass.

```
nrow(subset(work,
            subset = (CRApproved == "A-FP" & IEApproved == "A-FP"))) /
     nrow(work) * 100
```

```
## [1] 44.0678
```

Number by Application

Opened

```
table(subset(workCR,
             subset = CRApproved != "D")$Application)
```

Completed

```
table(subset(workIE,
             subset = IEApproved != "D")$Application)
```

Total

```
table(subset(workCR,
             subset = CRApproved != "D")$Application) +
     table(subset(workIE,
             subset = IEApproved != "D")$Application)
```

Time to Complete A Data Change

This is the interval between CR approval and IE approval

```
# select from work all that had approved IE for the month
work.all <- subset(work,
                   subset = (IEApproved == "A" | IEApproved == "A-FP"))
# need to figure out a way to make this unique and selected the correct record


# compute interval
work.all$Interval <- as.numeric(work.all$IEDate - work.all$CRDate)
# results
nrow(work.all)
```

```
## [1] 56
```

```
summary(work.all$Interval)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    0.00    8.00   13.50   25.89   28.00  152.00
```

```
sd(work.all$Interval)
```

```
## [1] 29.81804
```

```
table(work.all$Interval)
```

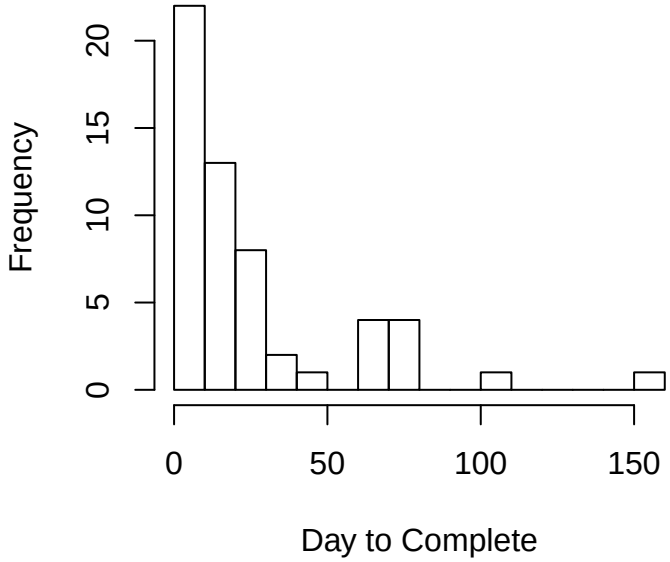
```
##
##   0   1   3   4   5   6   7   8   9  10  11  13  14  15  16  18  21  25
##   1   2   1   1   2   3   2   5   1   4   2   4   1   3   1   2   4   1
##  26  28  35  39  48  61  63  65  73  75  76 106 152
##   1   2   1   1   1   1   1   2   1   1   2   1   1
```

```
quantile(work.all$Interval)
```

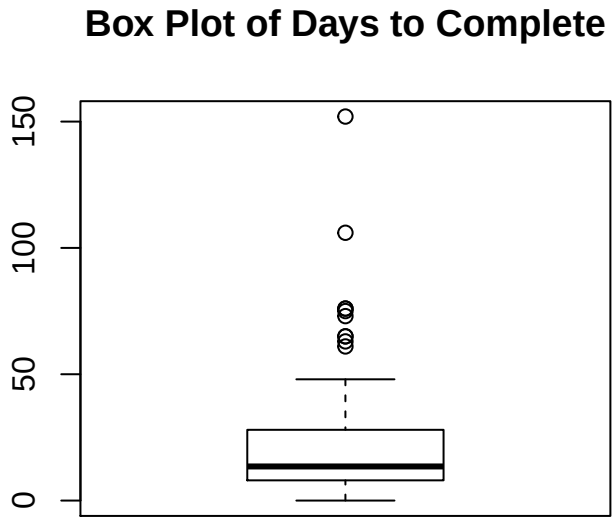
```
##    0%   25%   50%   75%  100%
##   0.0   8.0  13.5  28.0 152.0
```

```
hist(work.all$Interval,
     breaks = 20,
     main = "Histogram of Days to Complete A Change Request",
     xlab = "Day to Complete")
```

istogram of Days to Complete A Change Re



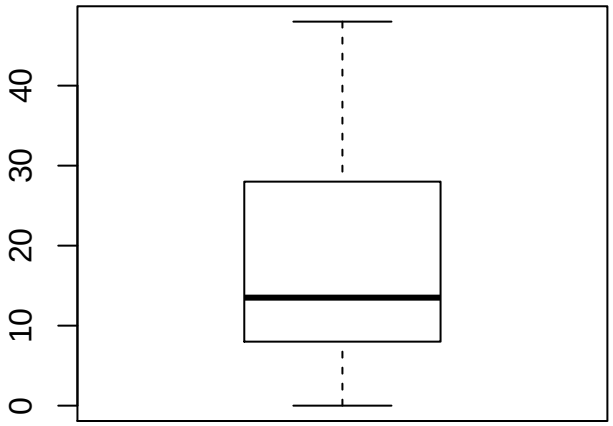

```
boxplot(work.all$Interval,
        main = "Box Plot of Days to Complete")
```




```
boxplot(work.all$Interval,
        main = "Box Plot of Days to Complete With Outliers Removed",
```

```
        outline = FALSE)
```

x Plot of Days to Complete With Outliers Re



Number of Days That Currently Open CR Have Been Pending

```
# selected records that have approved CR but no IE
work.open <- subset(ACR,
                    subset = (CRApproved == "A-FP" | CRApproved == "A") &
                         is.na(IEApproved))
# compute days open                                  Set below to first of next month
work.open$daysOpen <- as.numeric(as.Date("1-Jun-19",
                                         format = "%d-%b-%y") -
                                       work.open$CRDate)
# Results
nrow(work.open)
```

```
## [1] 146
```

```
summary(work.open$daysOpen)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    1.00   22.50   65.50   72.39  113.00  227.00
```

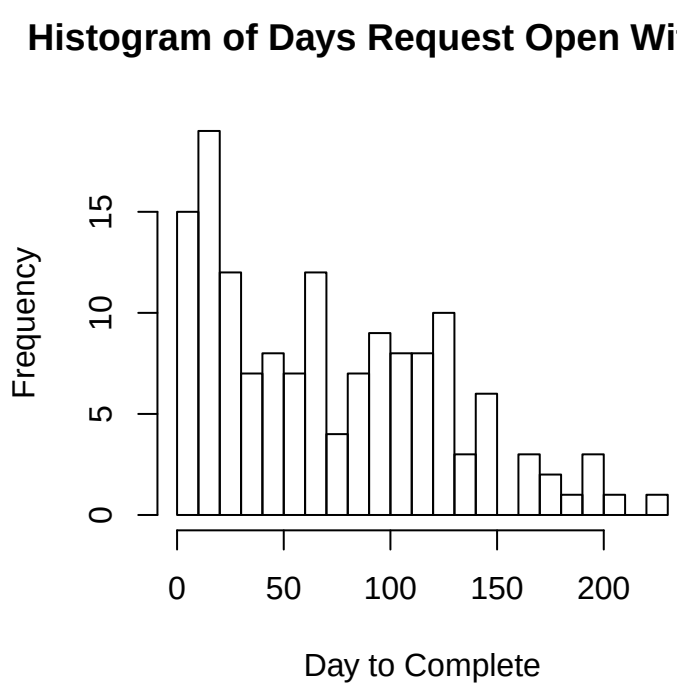
```
sd(work.open$daysOpen)
```

```
## [1] 53.70126
```

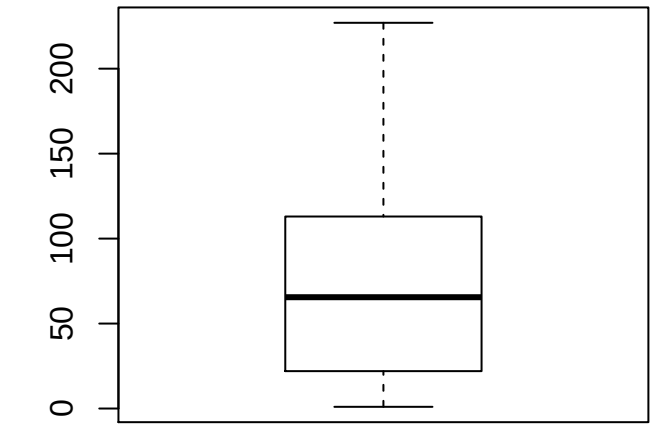
```
quantile(work.open$daysOpen)
```

```
##    0%   25%   50%   75%  100%
##   1.0  22.5  65.5 113.0 227.0
```

```r
hist(work.open$daysOpen,
     breaks = 20,
     main = "Histogram of Days Request Open With No IE",
     xlab = "Day to Complete")
```




```r
boxplot(work.open$daysOpen,
        main = "Box Plot of Days Request Open With No IE")
```




```
boxplot(work.open$daysOpen,
        main = "Box Plot of Days Request Open With No IE With Outliers Removed",
        outline = FALSE)
```