Dublin Airport Weather analysis

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R Markdown

```
# extracting data from csv...
DublinAirport<-read.csv("mly532.csv",header=TRUE,skip = 19,na.strings = "NA")
# displaying structure of dataset
str(DublinAirport)
```

```
## 'data.frame':    931 obs. of  12 variables:
## $ year : int  1941 1941 1942 1942 1942 1942 1942 1942 1942 1942 ...
## $ month: int  11 12 1 2 3 4 5 6 7 8 ...
## $ meant: num  6.9 6.5 4.3 2.9 6.3 8.4 10.4 13.1 14.6 14.9 ...
## $ maxtp: num  14 12.7 11.9 11.6 16.2 16.2 20.9 24.1 22.2 22.3 ...
## $ mintp: num  -3.1 -3.6 -3.1 -4.3 -6.1 0.8 1.8 1.4 7.2 6.7 ...
## $ mnmax: num  9.9 9.1 6.9 5.8 9.4 11.9 14.4 18 18.9 18.4 ...
## $ mnmin: num  3.9 3.9 1.7 0 3.2 4.9 6.3 8.2 10.4 11.4 ...
## $ rain : num  67.2 41.7 91.9 25.8 76.4 ...
## $ gmin : num  -5.7 -7.6 -9.5 -10.7 -8.3 -0.4 -0.7 -0.9 2.4 4.6 ...
## $ wdsp : num  12 12.5 13.1 9 10.7 15.1 12 9.4 13.4 10.8 ...
## $ maxgt: int  NA NA NA NA NA NA NA NA NA NA ...
## $ sun  : num  56.1 46.1 72.8 51.4 73.9 ...
```

```
# using months.name to assign month name as per order
DublinAirport$month <- factor(DublinAirport$month,level = 1:12,labels =  month.name)
```

```
# storing the average rain as per month in a variable
avg_rain <- aggregate(DublinAirport$rain,by=list(DublinAirport$month),mean)
# Ordering the saved values in the order of average for each month
ordr_rain <- avg_rain[order(avg_rain$x),]
View(ordr_rain[1,1])
View(ordr_rain[12,1])
```

On average February has the least rain and October has the highest rain

```
# creating columns for each month by using asigning label in the order of of months
DublinAirport$Seasons <- factor(DublinAirport$month,level = month.name,labels =c('Win
ter','Winter','Spring','Spring','Spring','Summer','Summer','Summer','Autumn','Autumn'
,'Autumn','Winter'))
```

```
# assigning classes to DublinAirport
class(DublinAirport) <- c('WeatherData','data.frame')
```

```r
summary.WeatherData <- function(fun){
# storing mean,sd,min,max for the required fields by first binding them on the basis
of column Seasons
 dat1=aggregate(cbind(rain,maxtp,mintp,maxgt)~ Seasons, data=fun, mean)
 dat2=aggregate(cbind(rain,maxtp,mintp,maxgt)~ Seasons, data=fun, sd)
 dat3=aggregate(cbind(rain,maxtp,mintp,maxgt)~ Seasons, data=fun, min)
 dat4=aggregate(cbind(rain,maxtp,mintp,maxgt)~ Seasons, data=fun, max)

 # Printing the the stored variables, using print.data.frame to keep the structure in
tact
 print('Mean')
 print.data.frame(dat1)
 print('Standard deviation')
 print.data.frame(dat2)
 print('min')
 print.data.frame(dat3)
 print('max')
 print.data.frame(dat4)


}
summary.WeatherData(DublinAirport)
```

```
## [1] "Mean"
##    Seasons     rain    maxtp     mintp    maxgt
## 1   Winter 64.41211 12.74798 -3.216592 53.04933
## 2   Spring 53.79156 17.16178 -0.560000 45.57333
## 3   Summer 64.15867 23.02356  5.944889 39.49333
## 4   Autumn 70.66741 18.03705  1.300000 47.23661
## [1] "Standard deviation"
##    Seasons     rain    maxtp    mintp    maxgt
## 1   Winter 32.99175 1.658335 2.383964 8.767892
## 2   Spring 27.03682 2.821119 2.397115 7.426136
## 3   Summer 35.57112 1.801965 1.728331 6.263642
## 4   Autumn 38.25498 3.035664 2.807278 7.875278
## [1] "min"
##    Seasons rain maxtp mintp maxgt
## 1   Winter  4.7   4.8 -12.2    35
## 2   Spring  3.6   9.9  -7.9    28
## 3   Summer  4.8  18.4   0.7    27
## 4   Autumn  3.6  12.1  -8.4    27
## [1] "max"
##    Seasons  rain maxtp mintp maxgt
## 1   Winter 217.0  17.1   1.8    80
## 2   Spring 151.8  23.5   6.9    66
## 3   Summer 189.9  28.7  10.0    56
## 4   Autumn 185.8  25.1   7.5    73
```

```r
plot.WeatherData <- function(fun,period1=FALSE,period2=FALSE,p1=FALSE,p2=FALSE,p3=FAL
SE){
  # handling scenario where both the years are given
  if(period1!=FALSE&&period2!=FALSE){
    period=c(period1:period2)
  }
  # handling scenario where only one year is mentioned
  else if(period1!=FALSE&&period2==FALSE){
    period=period1
  }# handling scenario where only no year is mentioned
  else {period=c(2015:2018)}
  # extracting values from the passed dataframe according as per years recived
  small_set=fun[fun$year %in% period,]

  # when all 3 plots are required
  if((p1!=FALSE && p2!=FALSE && p3!=FALSE)||(p1==FALSE && p2==FALSE && p3==FALSE)){

    par(mfrow=c(1,3))
    # Plot of the monthly Air Temperature
    plot(small_set$month,small_set$maxtp,type = 'p',col='red' ,  xlab="Months",      y
lab = "Air Temperature (C)", main = "Air Temperature")
    par(new=TRUE)
    plot(small_set$month,small_set$mintp,type = 'p',col= 'blue',axes = FALSE)
    axis(side=4,at=pretty(range(small_set$mintp)))
    legend('topleft',legend = c('maximum temperature','minimum temperature')      ,c
ol = c('red','blue'),lty=1:2)

    # Plot of the Precipitation Amount
    plot(small_set$year,small_set$rain,col=small_set$month,xlab = "Years", ylab     =
"Precipitation Amount (mm)", main = "Precipitation Amount")
    # Plot of the Highest Gust
    plot(small_set$year,small_set$maxgt,col=small_set$month,xlab = "Years",       yl
ab = "Highest Gust (knot)", main = "Highest Gust")
  }
  else {
    # when only first plot is required
    if(p1!=FALSE && p2==FALSE && p3==FALSE){
      plot(small_set$month,small_set$maxtp,type = 'p',col='red',xlab="Months",
 ylab = "Air Temperature (C)", main = "Air Temperature" )
      par(new=TRUE)
      plot(small_set$month,small_set$mintp,type = 'p',col= 'blue',axes = FALSE)
      axis(side=4,at=pretty(range(small_set$mintp)))
      legend('topleft',legend = c('maximum temperature','minimum temperature')
 ,col = c('red','blue'),lty=1:2)
    }

    # when first and second plot is required
    if(p1!=FALSE && p2!=FALSE && p3==FALSE){
      par(mfrow=c(1,2))
      plot(small_set$month,small_set$maxtp,type = 'p',col='red', xlab="Months",
ylab = "Air Temperature (C)", main = "Air Temperature" )
      par(new=TRUE)
      plot(small_set$month,small_set$mintp,type = 'p',col= 'blue',axes = FALSE)
      axis(side=4,at=pretty(range(small_set$mintp)))
      legend('topleft',legend = c('maximum temperature','minimum temperature')
 ,col = c('red','blue'),lty=1:2)
```
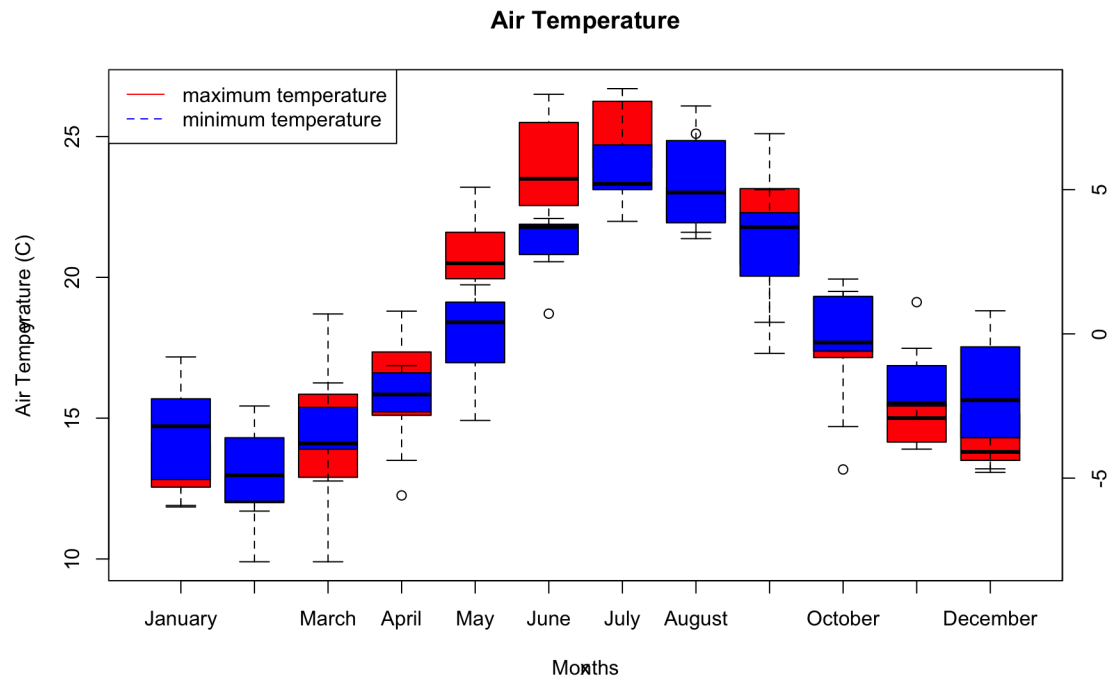
```r
    plot(small_set$year,small_set$rain,col=small_set$month,xlab = "Years",
  ylab = "Precipitation Amount (mm)",  main = "Precipitation Amount")
    }
    # when first and third plot is required
    else if(p1!=FALSE && p2==FALSE && p3!=FALSE){
      par(mfrow=c(1,2))
      plot(small_set$month,small_set$maxtp,type = 'p',col='red',xlab ="Months",
ylab = "Air Temperature (C)", main = "Air Temperature" )
      par(new=TRUE)
      plot(small_set$month,small_set$mintp,type = 'p',col= 'blue')
      axis(side=4,at=pretty(range(small_set$mintp)))
      legend('topleft',legend = c('maximum temperature','minimum temperature')
 ,col = c('red','blue'),lty=1:2)

      plot(small_set$year,small_set$maxgt,col=small_set$month,xlab = "Years",
  ylab = "Highest Gust (knot)", main = "Highest Gust")
    }
    # when only second plot is required
    if(p1==FALSE && p2!=FALSE && p3==FALSE ){
      plot(small_set$year,small_set$rain,col=small_set$month,xlab = "Years",
  ylab = "Precipitation Amount (mm)", main = "Precipitation Amount")
    }
    # when second and third plot is required
    if(p1==FALSE && p2!=FALSE && p3!=FALSE ){
      par(mfrow=c(1,2))
      plot(small_set$year,small_set$rain,col=small_set$month,xlab = "Years",
  ylab = "Precipitation Amount (mm)", main = "Precipitation Amount")

      plot(small_set$year,small_set$maxgt,col=small_set$month)
    }
    # when only third plot is required
    if(p1==FALSE && p2==FALSE && p3!=FALSE)
      {plot(small_set$year,small_set$maxgt,col=small_set$month,xlab = "Years",
ylab = "Highest Gust (knot)", main = "Highest Gust")}
    }

}
plot.WeatherData(DublinAirport,2012,2018,1)
```

Air Temperature


```
plot.WeatherData(DublinAirport)
```