Programming Assignment 3 : Hospital Comparison

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For more details about this assignment, please read: assignment details

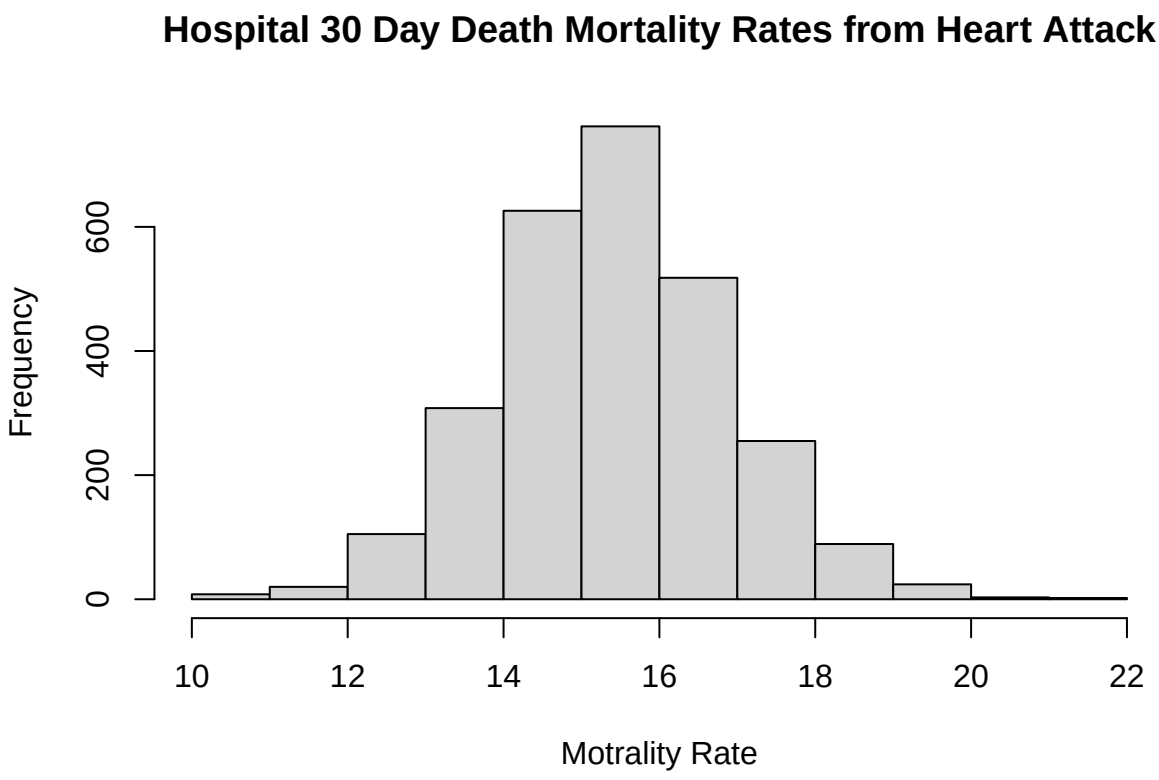
```
outcome <- read.csv("outcome-of-care-measures.csv", colClasses = "character")
```

1. Plot the 30-day mortality rates for heart attack:

```
outcome[, 11] <- as.numeric(outcome[, 11])
```

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

```
hist(outcome[, 11], main = "Hospital 30 Day Death Mortality Rates from Heart Attack",
     xlab= "Motrality Rate")
```



2. Finding the best hospital in a state:

```
best <- function(state, outcome) {
  #Read data:
  ocdata <- read.csv("outcome-of-care-measures.csv", colClasses = "character",
    na.strings = NA , stringsAsFactors =  FALSE)


  #check that arguments are valid:
  if (!state %in% ocdata$State) {
    stop("invalid state")
  }

  if (outcome == "heart attack") {
    colname= "Hospital.30.Day.Death..Mortality..Rates.from.Heart.Attack"
  } else if (outcome =="heart failure"){
    colname= "Hospital.30.Day.Death..Mortality..Rates.from.Heart.Failure"
  } else if (outcome == "pneumonia") {
    colname = "Hospital.30.Day.Death..Mortality..Rates.from.Pneumonia"
  } else {
    stop ("invalid outcome")
  }

  #order data:

  ocdata2 <- subset(ocdata, State == state, select = c("Hospital.Name", colname ))
  ocdata2[,colname] <- as.numeric(ocdata2[,colname])
  ocdata2 <- ocdata2[order(ocdata2[,2], ocdata2[,1]),]
  ocdata2 <- na.omit(ocdata2)

  #return hospital name:
   ocdata2[1, 1]

}

#Examples:
source("best.R")
best("TX", "heart attack")
```

```
## Warning in best("TX", "heart attack"): NAs introduced by coercion
```

```
## [1] "CYPRESS FAIRBANKS MEDICAL CENTER"
```

```
best("TX", "heart failure")
```

```
## Warning in best("TX", "heart failure"): NAs introduced by coercion
```

```
## [1] "FORT DUNCAN MEDICAL CENTER"
```

```r
best("MD", "heart attack")
```

```
## Warning in best("MD", "heart attack"): NAs introduced by coercion
```

```
## [1] "JOHNS HOPKINS HOSPITAL, THE"
```

```r
best("MD", "pneumonia")
```

```
## [1] "GREATER BALTIMORE MEDICAL CENTER"
```

3. Ranking hospitals by outcome in a state:

```r
rankhospital <- function(state, outcome, num = "best") {
  #Read data:
  ocdata <- read.csv("outcome-of-care-measures.csv", colClasses = "character",
  na.strings = NA , stringsAsFactors =  FALSE)


  #check that arguments are valid:
  if (!state %in% ocdata$State) {
    stop("invalid state")
  }

  if (outcome == "heart attack") {
    colname= "Hospital.30.Day.Death..Mortality..Rates.from.Heart.Attack"
  } else if (outcome =="heart failure"){
    colname= "Hospital.30.Day.Death..Mortality..Rates.from.Heart.Failure"
  } else if (outcome == "pneumonia") {
    colname = "Hospital.30.Day.Death..Mortality..Rates.from.Pneumonia"
  } else {
    stop ("invalid outcome")
  }

  #order data:

  ocdata2 <- subset(ocdata, State == state, select = c("Hospital.Name", colname ))
  ocdata2[,colname] <- as.numeric(ocdata2[,colname])
  ocdata2 <- ocdata2[order(ocdata2[,2], ocdata2[,1]),]
  ocdata2 <- na.omit(ocdata2)

  #return hospital name:
  if (num == "best") {
    ocdata2[1,1]
  }
  else if (num == "worst" ){
    ocdata2[nrow(ocdata2),1]
  }
  else {
    ocdata2[num, 1]
  }
```

```
}

#Examples:
source("rankhospital.R")
 rankhospital("TX", "heart failure", 4)
```

```
## Warning in rankhospital("TX", "heart failure", 4): NAs introduced by coercion
```

```
## [1] "DETAR HOSPITAL NAVARRO"
```

```
 rankhospital("MD", "heart attack", "worst")
```

```
## Warning in rankhospital("MD", "heart attack", "worst"): NAs introduced by
## coercion
```

```
## [1] "HARFORD MEMORIAL HOSPITAL"
```

```
 rankhospital("MN", "heart attack", 5000)
```

```
## Warning in rankhospital("MN", "heart attack", 5000): NAs introduced by coercion
```

```
## [1] NA
```

4. Ranking hospitals in all states:

```
rankall <- function(outcome, num = "best") {
  #Read data:
  ocdata <- read.csv("outcome-of-care-measures.csv", colClasses = "character",
  na.strings = NA , stringsAsFactors =  FALSE)


  #check that outcome is valid:

  if (outcome == "heart attack") {
    colname= "Hospital.30.Day.Death..Mortality..Rates.from.Heart.Attack"
  } else if (outcome =="heart failure"){
    colname= "Hospital.30.Day.Death..Mortality..Rates.from.Heart.Failure"
  } else if (outcome == "pneumonia") {
    colname = "Hospital.30.Day.Death..Mortality..Rates.from.Pneumonia"
  } else {
    stop ("invalid outcome")
  }

  #order data:

  ocdata2 <- subset(ocdata, select = c("Hospital.Name", "State", colname ))
  ocdata2[,colname] <- as.numeric(ocdata2[,colname])
  ocdata2 <- ocdata2[order(ocdata2$State, ocdata2[,3], ocdata2$Hospital.Name),]
  ocdata2 <- na.omit(ocdata2)
```

```
  #split data acc to state:
  ocdata3 <- split(ocdata2, ocdata2$State)

  #find the hospital with rank "num" in each state:
  hospital_Name <- sapply(ocdata3, function(elt, num = "best"){
    if (num == "best") {
      elt[1,1]
    }
    else if (num == "worst" ){
      elt[length(elt),1]
    }
    else  {
     elt[num,1]
    }

  } , num)

  # create data frame consists of the hospital name with rank num and the state
df <- as.data.frame(hospital_Name, names(ocdata3))
df2 <- cbind(df, names(ocdata3))
colnames(df2)<- c("Hospital Name", "State")
df2
}

#Examples:
 source("rankall.R")
 head(rankall("heart attack", 20), 10)
```

```
## Warning in rankall("heart attack", 20): NAs introduced by coercion
```

```
##                            Hospital Name State
## AK                                   <NA>    AK
## AL      D W MCMILLAN MEMORIAL HOSPITAL    AL
## AR   ARKANSAS METHODIST MEDICAL CENTER    AR
## AZ JOHN C LINCOLN DEER VALLEY HOSPITAL    AZ
## CA               SHERMAN OAKS HOSPITAL    CA
## CO            SKY RIDGE MEDICAL CENTER    CO
## CT             MIDSTATE MEDICAL CENTER    CT
## DC                                   <NA>    DC
## DE                                   <NA>    DE
## FL      SOUTH FLORIDA BAPTIST HOSPITAL    FL
```

```
 tail(rankall("pneumonia", "worst"), 3)
```

```
## Warning in rankall("pneumonia", "worst"): NAs introduced by coercion
```

```
##                          Hospital Name State
## WI   AURORA WEST ALLIS MEDICAL CENTER    WI
## WV          BECKLEY VA MEDICAL CENTER    WV
## WY MEMORIAL HOSPITAL OF CARBON COUNTY    WY
```

```
tail(rankall("heart failure"), 10)
```

```
## Warning in rankall("heart failure"): NAs introduced by coercion
```

```
##                                                  Hospital Name State
## TN                          WELLMONT HAWKINS COUNTY MEMORIAL HOSPITAL    TN
## TX                                    FORT DUNCAN MEDICAL CENTER    TX
## UT VA SALT LAKE CITY HEALTHCARE - GEORGE E. WAHLEN VA MEDICAL CENTER    UT
## VA                                      SENTARA POTOMAC HOSPITAL    VA
## VI                            GOV JUAN F LUIS HOSPITAL & MEDICAL CTR    VI
## VT                                         SPRINGFIELD HOSPITAL    VT
## WA                                       HARBORVIEW MEDICAL CENTER    WA
## WI                                  AURORA ST LUKES MEDICAL CENTER    WI
## WV                                       FAIRMONT GENERAL HOSPITAL    WV
## WY                                     CHEYENNE VA MEDICAL CENTER    WY
```