choosingReponse

Song

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```r
load("../Data/Payment_NPI_ca.RData")
data<- Payment_NPI_ca  # renaming
data [1:5,]
```

```
##           NPI NPPES_PROVIDER_LAST_ORG_NAME NPPES_PROVIDER_FIRST_NAME
## 1 1003000712                      MALLORY                    SHEILA
## 2 1003001017                      NICHOLS                  LAWRENCE
## 3 1003001017                      NICHOLS                  LAWRENCE
## 4 1003001017                      NICHOLS                  LAWRENCE
## 5 1003001017                      NICHOLS                  LAWRENCE
##   NPPES_PROVIDER_MI NPPES_CREDENTIALS NPPES_PROVIDER_GENDER
## 1                 O             N. P.                     F
## 2                 M              M.D                      M
## 3                 M              M.D                      M
## 4                 M              M.D                      M
## 5                 M              M.D                      M
##   NPPES_ENTITY_CODE NPPES_PROVIDER_STREET1 NPPES_PROVIDER_STREET2
## 1                 I 1867 E FIR AVE STE 104
## 2                 I      5471 LA PALMA AVE              STE. 202
## 3                 I      5471 LA PALMA AVE              STE. 202
## 4                 I      5471 LA PALMA AVE              STE. 202
## 5                 I      5471 LA PALMA AVE              STE. 202
##   NPPES_PROVIDER_CITY NPPES_PROVIDER_ZIP NPPES_PROVIDER_STATE
## 1              FRESNO          937203841                   CA
## 2            LA PALMA          906231745                   CA
## 3            LA PALMA          906231745                   CA
## 4            LA PALMA          906231745                   CA
## 5            LA PALMA          906231745                   CA
##   NPPES_PROVIDER_COUNTRY      PROVIDER_TYPE
## 1                     US Nurse Practitioner
## 2                     US         Dermatology
## 3                     US         Dermatology
## 4                     US         Dermatology
## 5                     US         Dermatology
##   MEDICARE_PARTICIPATION_INDICATOR PLACE_OF_SERVICE HCPCS_CODE
## 1                                Y                F      77001
## 2                                Y                O      17000
## 3                                Y                O      17003
## 4                                Y                O      17004
## 5                                Y                O      96910
##                                                          HCPCS_DESCRIPTION
## 1          Fluoroscopic guidance for insertion of device into vein
## 2                                              Destruction of skin growth
## 3                                     Destruction of multiple skin growths
## 4                                     Destruction of multiple skin growths
## 5 Skin application of tar and ultraviolet B or petrolatum and ultraviolet B
##   HCPCS_DRUG_INDICATOR LINE_SRVC_CNT BENE_UNIQUE_CNT BENE_DAY_SRVC_CNT
```

```
## 1                     N         12         12         12
## 2                     N        119         57        119
## 3                     N        193         37         66
## 4                     N        469        171        469
## 5                     N        133         33        133
##   AVERAGE_MEDICARE_ALLOWED_AMT STDEV_MEDICARE_ALLOWED_AMT
## 1                     15.81000                   0.000000
## 2                     93.77479                  10.524778
## 3                      7.69000                   0.000000
## 4                    194.58000                   0.000000
## 5                     91.41218                   9.936998
##   AVERAGE_SUBMITTED_CHRG_AMT STDEV_SUBMITTED_CHRG_AMT
## 1                        69                        0
## 2                       100                        0
## 3                        10                        0
## 4                       220                        0
## 5                        95                        0
##   AVERAGE_MEDICARE_PAYMENT_AMT STDEV_MEDICARE_PAYMENT_AMT
## 1                    12.462500                 0.10825318
## 2                    70.819748                15.95507029
## 3                     6.064301                 0.09587557
## 4                   143.758166                30.07561059
## 5                    68.681278                15.37454421
```

```r
code <- table(data$HCPCS_CODE)
length(code)
```

```
## [1] 3803
```

```r
top20 <- sort(code,decreasing = T)[1:40]
top20
```

```
## 
## 99213 99214 99204 99203 99212 99232 99223 99215 99233 G0008 93000 99205
## 33190 29059 13769 12809 11940 11438 11268 10543  9631  8885  7784  7242
## 99222 99291 36415 96372 99284 93010 97110 71020 99283 99285 97140 97001
##  6240  5449  5181  4956  4644  4634  4446  4336  4234  4167  4095  3928
## 99238 99239 99231 99202 93306 81002 G0439 20610 99211 71010 92014 Q2038
##  3908  3747  3724  3611  3557  3545  3507  3445  3419  3187  3017  2954
## 93880 73030 90732 G0009
##  2921  2891  2861  2718
```

```r
# 99213 99214 99204 99203 99212 99232 99223 99215 99233 G0008 93000 99205 99222 99291 36415 96372
# 33190 29059 13769 12809 11940 11438 11268 10543  9631  8885  7784  7242  6240  5449  5181  4956
# 99284 93010 97110 71020
# 4644  4634  4446  4336
rownames(top20)
```

```
##  [1] "99213" "99214" "99204" "99203" "99212" "99232" "99223" "99215"
##  [9] "99233" "G0008" "93000" "99205" "99222" "99291" "36415" "96372"
## [17] "99284" "93010" "97110" "71020" "99283" "99285" "97140" "97001"
## [25] "99238" "99239" "99231" "99202" "93306" "81002" "G0439" "20610"
## [33] "99211" "71010" "92014" "Q2038" "93880" "73030" "90732" "G0009"
```

```r
ord <- order(data$HCPCS_CODE)
data1 <- data[data$HCPCS_CODE %in% rownames(top20),]
unique(data1$HCPCS_CODE)
```

```
##  [1] "99203" "99213" "99223" "20610" "99202" "99214" "99204" "99212"
##  [9] "99222" "99232" "99233" "99215" "G0008" "99283" "99284" "99285"
## [17] "99291" "97001" "97110" "99231" "36415" "99211" "99205" "99239"
## [25] "92014" "99238" "71020" "93000" "96372" "71010" "73030" "93880"
## [33] "97140" "93306" "81002" "93010" "Q2038" "90732" "G0009" "G0439"
```

```r
ord <- order(data1$HCPCS_CODE)
data1ordered <- data1[ord,]
idx <- cumsum(table(data1ordered$HCPCS_CODE))
# 36415   71020   93000   93010   96372   97110   99203   99204   99205   99212   99213   99214   99215   99222
# 5181    9517   17301   21935   26891   31337   44146   57915   65157   77097  110287  139346  149889  156129
# 99223   99232   99233   99284   99291   G0008
# 167397  178835  188466  193110  198559  207444
cbind(table(data1ordered$HCPCS_CODE), data1ordered[idx,c("HCPCS_DESCRIPTION")])
```

```
##         [,1]
## 20610 "3445"
## 36415 "5181"
## 71010 "3187"
## 71020 "4336"
## 73030 "2891"
## 81002 "3545"
## 90732 "2861"
## 92014 "3017"
## 93000 "7784"
## 93010 "4634"
## 93306 "3557"
## 93880 "2921"
## 96372 "4956"
## 97001 "3928"
## 97110 "4446"
## 97140 "4095"
## 99202 "3611"
## 99203 "12809"
## 99204 "13769"
## 99205 "7242"
## 99211 "3419"
## 99212 "11940"
## 99213 "33190"
## 99214 "29059"
## 99215 "10543"
## 99222 "6240"
## 99223 "11268"
## 99231 "3724"
## 99232 "11438"
## 99233 "9631"
## 99238 "3908"
## 99239 "3747"
```

```
## 99283 "4234"
## 99284 "4644"
## 99285 "4167"
## 99291 "5449"
## G0008 "8885"
## G0009 "2718"
## G0439 "3507"
## Q2038 "2954"
##       [,2]
## 20610 "Aspiration or injection of large joint or joint capsule"
## 36415 "Insertion of needle into vein for collection of blood sample"
## 71010 "X-ray of chest, 1 view, front"
## 71020 "X-ray of chest, 2 views, front and side"
## 73030 "X-ray of shoulder, minimum of 2 views"
## 81002 "Urinalysis, manual test"
## 90732 "Vaccine for pneumococcal polysaccharide for injection into muscle, patient 2 years or older"
## 92014 "Eye and medical examination for diagnosis and treatment, established patient, 1 or more visit
## 93000 "Routine EKG using at least 12 leads including interpretation and report"
## 93010 "Routine electrocardiogram (EKG) using at least 12 leads with interpretation and report"
## 93306 "Ultrasound examination of heart including color-depicted blood flow rate, direction, and valv
## 93880 "Ultrasound scanning of head and neck vessel blood flow (outside the brain)"
## 96372 "Injection into tissue or muscle for therapy, diagnosis, or prevention"
## 97001 "Physical therapy evaluation"
## 97110 "Therapeutic exercise to develop strength, endurance, range of motion, and flexibility, each 1
## 97140 "Manual (physical) therapy techniques to 1 or more regions, each 15 minutes"
## 99202 "New patient office or other outpatient visit, typically 20 minutes"
## 99203 "New patient office or other outpatient visit, typically 30 minutes"
## 99204 "New patient office or other outpatient visit, typically 45 minutes"
## 99205 "New patient office or other outpatient visit, typically 60 minutes"
## 99211 "Established patient office or other outpatient visit, typically 5 minutes"
## 99212 "Established patient office or other outpatient visit, typically 10 minutes"
## 99213 "Established patient office or other outpatient visit, typically 15 minutes"
## 99214 "Established patient office or other outpatient, visit typically 25 minutes"
## 99215 "Established patient office or other outpatient, visit typically 40 minutes"
## 99222 "Initial hospital inpatient care, typically 50 minutes per day"
## 99223 "Initial hospital inpatient care, typically 70 minutes per day"
## 99231 "Subsequent hospital inpatient care, typically 15 minutes per day"
## 99232 "Subsequent hospital inpatient care, typically 25 minutes per day"
## 99233 "Subsequent hospital inpatient care, typically 35 minutes per day"
## 99238 "Hospital discharge day management, 30 minutes or less"
## 99239 "Hospital discharge day management, more than 30 minutes"
## 99283 "Emergency department visit, moderately severe problem"
## 99284 "Emergency department visit, problem of high severity"
## 99285 "Emergency department visit, problem with significant threat to life or function"
## 99291 "Critical care delivery critically ill or injured patient, first 30-74 minutes"
## G0008 "Administration of influenza virus vaccine"
## G0009 "Administration of pneumococcal vaccine"
## G0439 "Annual wellness visit, includes a personalized prevention plan of service (pps), subsequent v
## Q2038 "Influenza virus vaccine, split virus, when administered to individuals 3 years of age and old
```
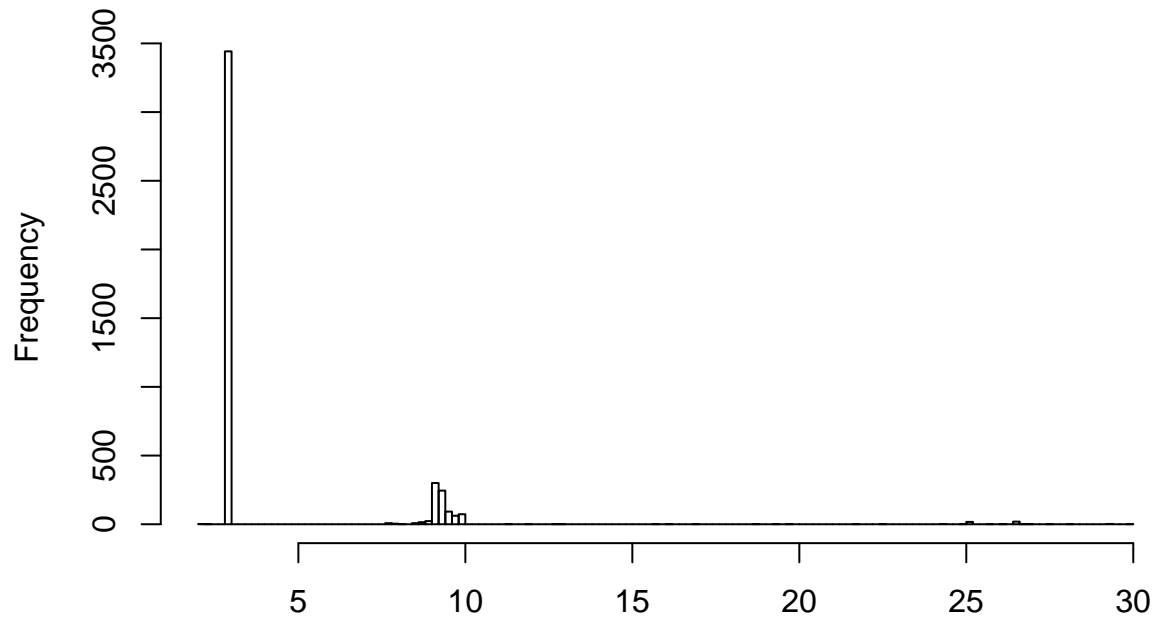
```r
library(ggplot2)
hist(data1ordered$AVERAGE_MEDICARE_ALLOWED_AMT[5182:9517],breaks=100,main="AVERAGE_MEDICARE_ALLOWED_AMT
```
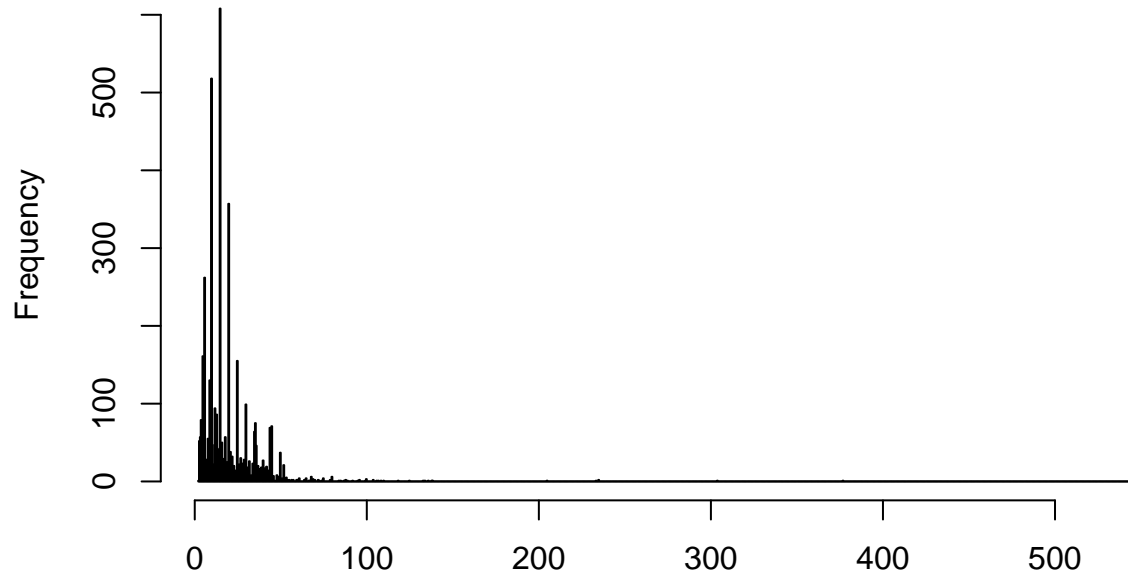
AVERAGE_MEDICARE_ALLOWED_AMT

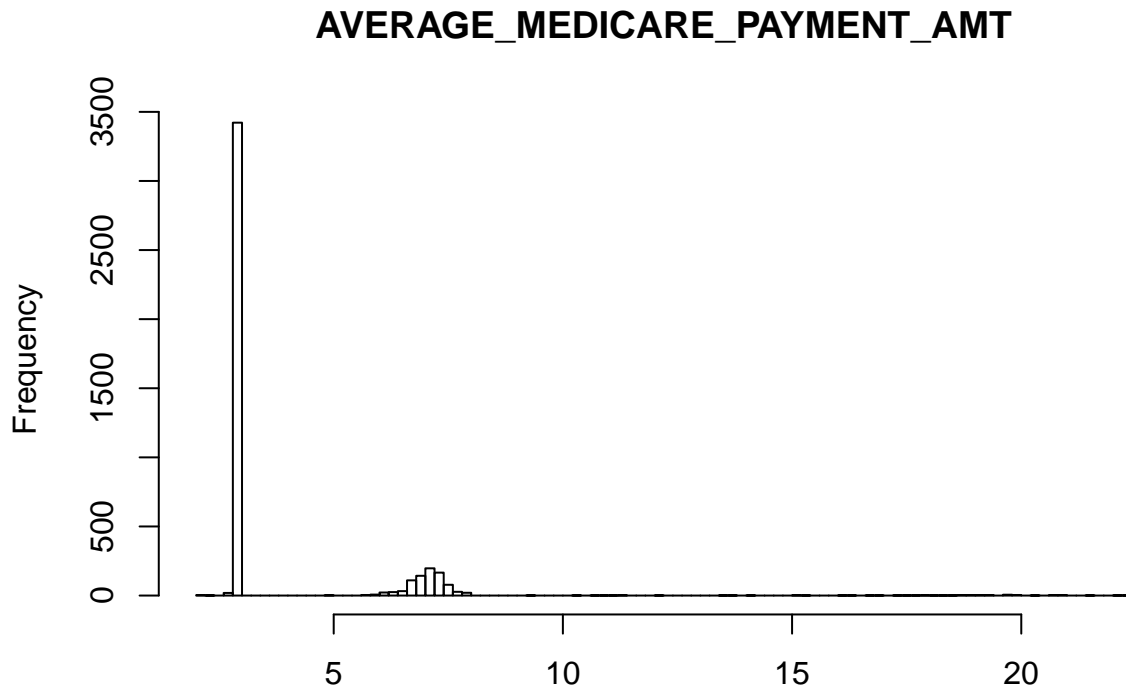data1ordered$AVERAGE_MEDICARE_ALLOWED_AMT[5182:9517]

```
hist(data1ordered$AVERAGE_SUBMITTED_CHRG_AMT[5182:9517],breaks=1000, main = "AVERAGE_SUBMITTED_CHRG_AMT
```

AVERAGE_SUBMITTED_CHRG_AMT
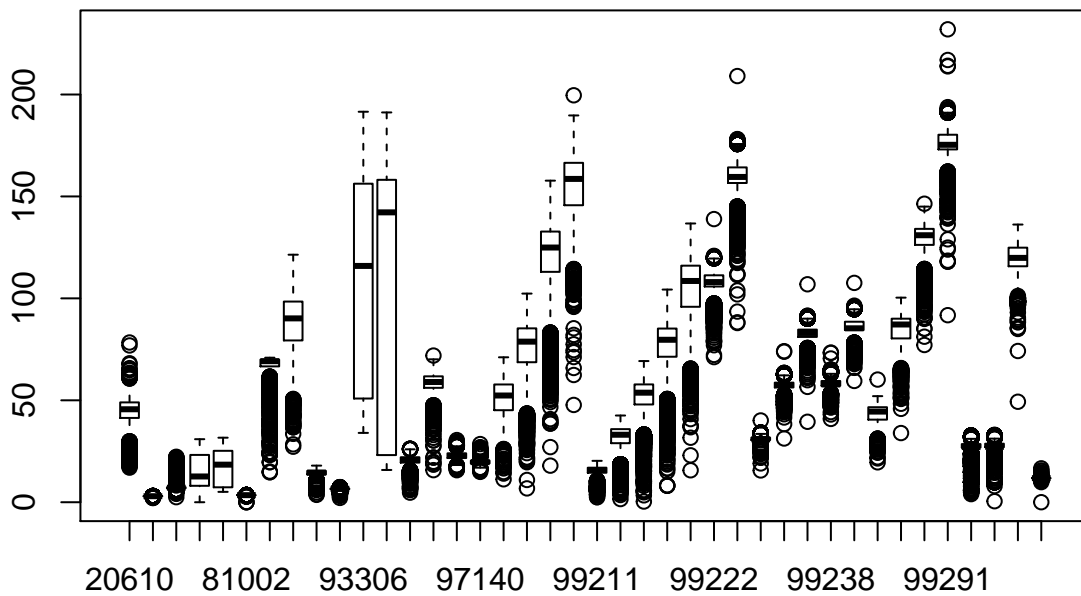

data1ordered$AVERAGE_SUBMITTED_CHRG_AMT[5182:9517]

```
hist(data1ordered$AVERAGE_MEDICARE_PAYMENT_AMT[5182:9517],breaks=100, main="AVERAGE_MEDICARE_PAYMENT_AMT
```
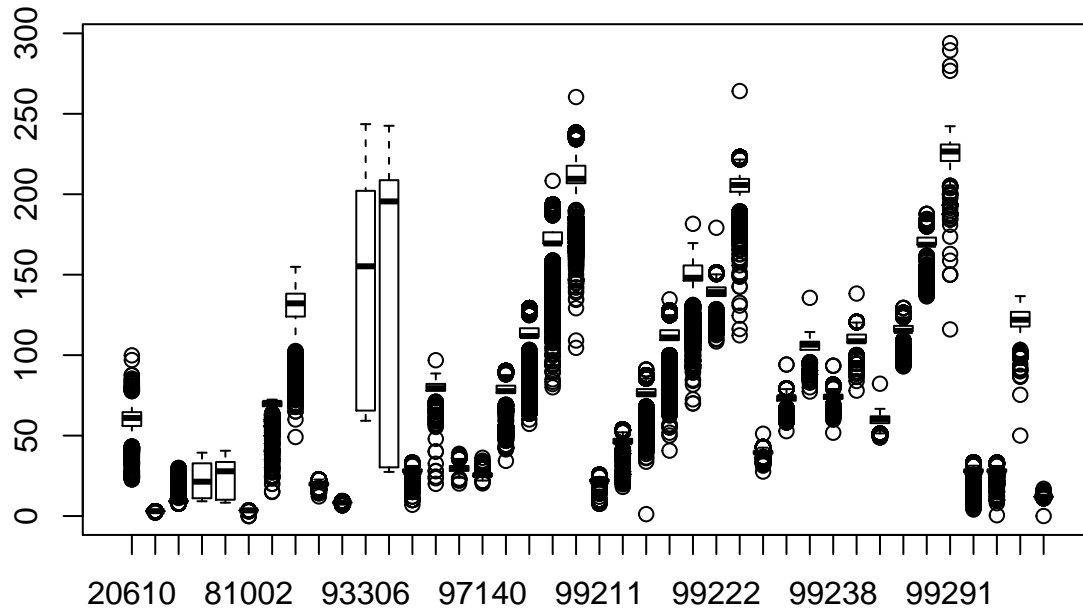
AVERAGE_MEDICARE_PAYMENT_AMT

data1ordered$AVERAGE_MEDICARE_PAYMENT_AMT[5182:9517]

```
boxplot(data1ordered$AVERAGE_MEDICARE_PAYMENT_AMT~data1ordered$HCPCS_CODE, main="AVERAGE_MEDICARE_PAYMEN
```

AVERAGE_MEDICARE_PAYMENT_AMT for top 20 frequent services
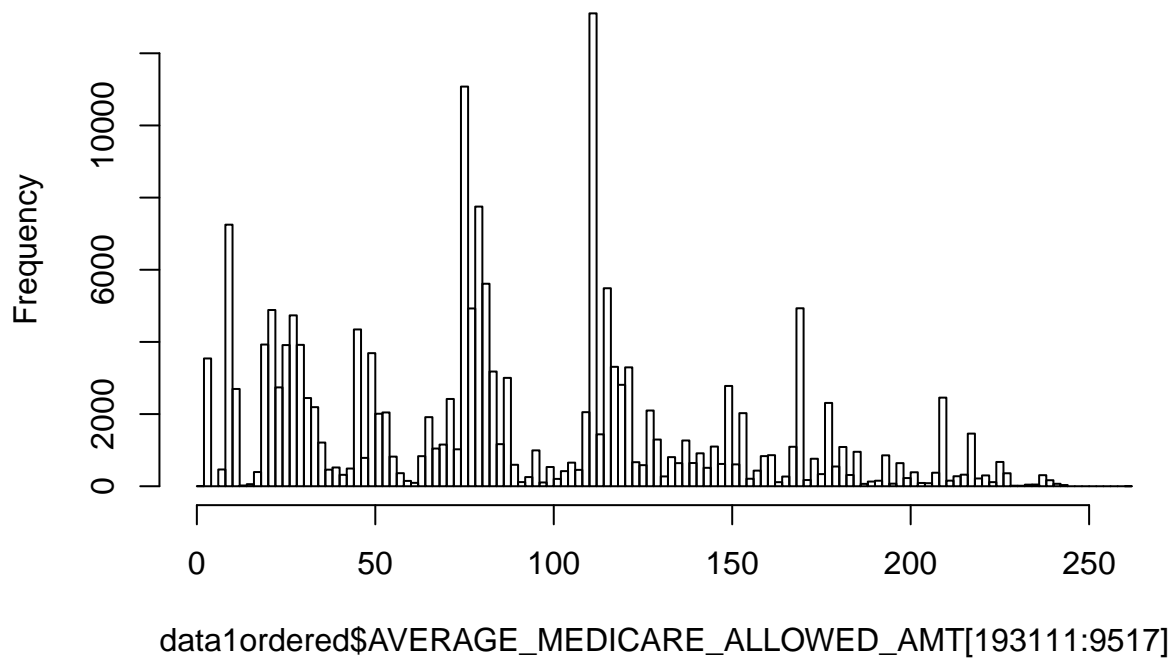
```
boxplot(data1ordered$AVERAGE_MEDICARE_ALLOWED_AMT~data1ordered$HCPCS_CODE, main="AVERAGE_MEDICARE_ALLOWE
```
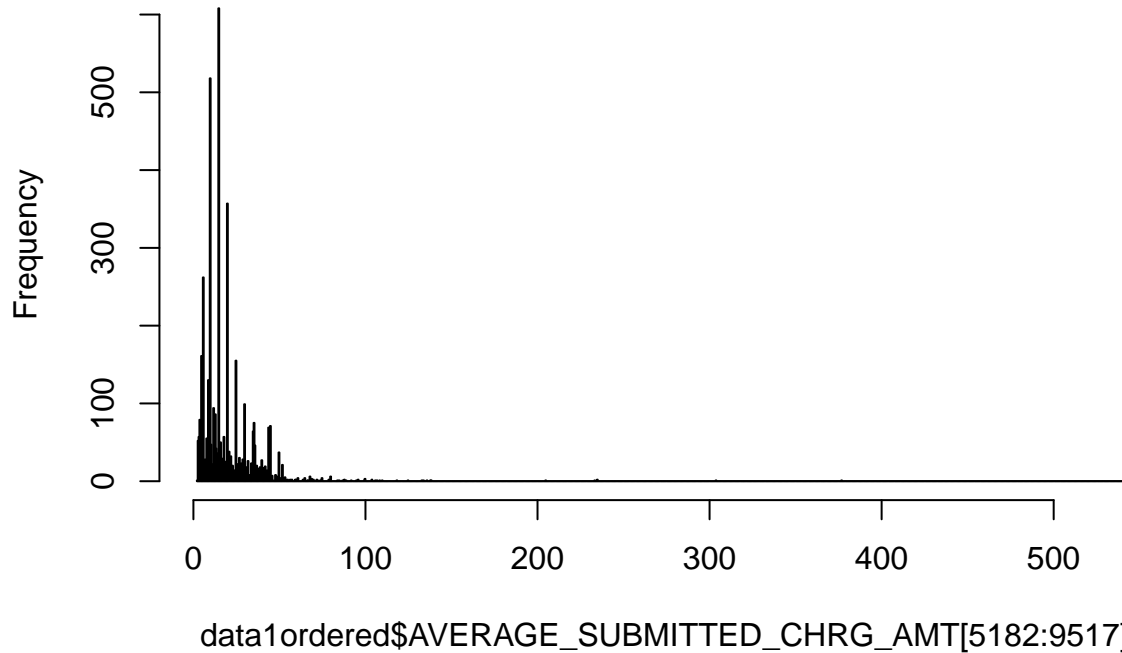
AVERAGE_MEDICARE_ALLOWED_AMT for top 20 frequent services


```
hist(data1ordered$AVERAGE_MEDICARE_ALLOWED_AMT[193111:9517],breaks=100)
```

togram of data1ordered$AVERAGE_MEDICARE_ALLOWED_AMT[19311

data1ordered$AVERAGE_MEDICARE_ALLOWED_AMT[193111:9517]

```r
hist(data1ordered$AVERAGE_SUBMITTED_CHRG_AMT[5182:9517],breaks=1000)
```

Histogram of data1ordered$AVERAGE_SUBMITTED_CHRG_AMT[5182:9

data1ordered$AVERAGE_SUBMITTED_CHRG_AMT[5182:9517]

```r
hist(data1ordered$AVERAGE_MEDICARE_PAYMENT_AMT[5182:9517],breaks=100)
```

stogram of data1ordered$AVERAGE_MEDICARE_PAYMENT_AMT[5182

data1ordered$AVERAGE_MEDICARE_PAYMENT_AMT[5182:9517]