Hospital Analysis

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ANALYZE THE HEALTHCARE COST AND UTILIZATION

```
hosp<-read.csv("HospitalCosts.csv")
hosp
```

```
##      AGE FEMALE LOS RACE TOTCHG APRDRG
## 1     17      1   2    1   2660    560
## 2     17      0   2    1   1689    753
## 3     17      1   7    1  20060    930
## 4     17      1   1    1    736    758
## 5     17      1   1    1   1194    754
## 6     17      0   0    1   3305    347
## 7     17      1   4    1   2205    754
## 8     16      1   2    1   1167    754
## 9     16      1   1    1    532    753
## 10    17      1   2    1   1363    758
## 11    17      1   2    1   1245    758
## 12    15      0   2    1   1656    753
## 13    15      1   2    1   1379    751
## 14    15      1   4    1   2346    758
## 15    15      1   7    1   4006    753
## 16    15      1   4    1   2181    758
## 17    14      1   1    1    628    754
## 18    14      1   4    1   2463    758
## 19    15      1   3    1   1956    753
## 20    14      1   3    1   1802    758
## 21    13      1   1    1   3188    812
## 22    17      1   2    1   2129    566
## 23    12      0   1    1   7421    249
## 24    15      1   1    1   1122    422
## 25    13      1   2    4   1173    754
## 26    12      0   2    1   3625    812
## 27    11      1   2    1   3908     50
## 28    15      0   1    1   3994    139
## 29    11      0   0    1   1033    753
## 30    10      0   2    1   2860    141
## 31    11      0   2    1   3814    420
## 32     7      0   0    1   1132    139
## 33    16      1   2    6   1163    751
## 34    17      1   1    1    610    751
## 35     6      0   3    1   9530     97
## 36    15      1   1    1   1268    811
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## 37   17      1   4    1   2582    753
## 38   16      1   2    1   1287    755
## 39   17      1   3    1   6594    930
## 40   13      1   0    1    909    755
## 41    7      0   0    1   2530    347
## 42   11      1   2    2   1534    753
## 43    3      0   5    1  14243    720
## 44   16      1   3    1   1699    754
## 45    2      0   2    1   7298     53
## 46   16      1   1    1    636    754
## 47   15      1   1    1    626    754
## 48    1      0   2    1   3782     53
## 49   14      1   2    1   1444    753
## 50   14      1   2    1   1183    754
## 51   14      1   5    1   3045    754
## 52   14      1   5    1   3624    754
## 53   14      1  12    1   6810    760
## 54    1      0   1    1   1409    249
## 55   13      0   2    1   1211    754
## 56    1      0   4    1   9606     53
## 57    1      1   1    1   1411    249
## 58   15      1   0    1    607    754
## 59    1      0   1    1   2932    249
## 60    1      0   3    1   5075    139
## 61   14      1   1    1    762    753
## 62   16      1   6    1   6329    753
## 63   17      1   1    1   1226    753
## 64    3      1   4    1   8223    710
## 65   17      0   2    1   1193    776
## 66   13      1   2    1   1076    754
## 67   12      1   6    1  17434    115
## 68   12      1   2    1   1647    753
## 69   14      1   7    1   3865    754
## 70   13      1   1    1    628    754
## 71   15      1   1    1    806    755
## 72    0      1  41    1  29188    602
## 73    0      0   2    1   4717    138
## 74    0      0  12    1  15129    137
## 75    0      1   2    1   1085    640
## 76    0      0   3    1   1607    640
## 77    0      1   3    1   1499    640
## 78    0      1   3    1   7648     53
## 79    0      1   2    1   1527    640
## 80    0      0   2    1   1483    640
## 81    0      1   4    1   2844    640
## 82    0      1   3    1   3124    640
## 83    0      0   3    1   1760    640
## 84    0      1   2    1   1278    640
## 85    0      1   2    1   1620    640
## 86    0      1   2    1   1220    640
```

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## 87    0      1   2    1   1134    640
## 88   16      1   0    1   1235    754
## 89    0      0   3    1   1656    640
## 90    0      0   4    5   4072    639
## 91    0      0   2    5   1393    143
## 92    0      0   0    5    615    254
## 93   16      1   1    1    779    755
## 94    0      0   2    1   1385    640
## 95    0      0   2    1   1224    640
## 96    0      1   3    1   1779    640
## 97    0      0   2    1   1526    640
## 98   15      1   1    1    882    754
## 99    0      0   1    1   2075    581
## 100   0      0  17    1  12042    633
## 101   0      0   2    1   1309    640
## 102   0      0   2    1   1290    640
## 103   0      0   2    1   1280    640
## 104   0      0   3    1   1719    640
## 105   0      1   2    1   1102    640
## 106   0      1   3    1   1543    640
## 107   0      1   2    1   1174    640
## 108   0      1   2    1   1105    640
## 109   0      0   2    1   1335    640
## 110   0      0   2    1   1550    640
## 111   0      0   4    1   2473    640
## 112   0      0   2    1   1322    640
## 113   0      0   4    1   2553    640
## 114  15      0   5    1   2835    753
## 115   0      1   2    1   1191    640
## 116   0      0   2    1   1439    640
## 117   0      1   2    1   1237    640
## 118   0      0   2    1   1265    640
## 119   0      1   4    1   2280    640
## 120   0      0   2    1   1096    640
## 121   0      1   2    1   1156    640
## 122   0      0   2    1   1199    640
## 123  13      1  10    1   5615    754
## 124   0      1   4    1   2518    640
## 125  15      0   0    1    625    754
## 126   0      1   2    1   1246    640
## 127   0      1   3    1   1821    640
## 128   0      0   5    1   3101    626
## 129  12      1   2    1   1293    754
## 130   0      1   2    1   1176    640
## 131   0      0   3    1   1891    640
## 132   5      1   2    1  10584     53
## 133  13      1   3    1   2373    754
## 134   0      0   1    1    935    640
## 135   0      0   2    1   1395    640
## 136   0      0   2    1   1561    640
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## 137   0      1   7    1   6912    636
## 138  12      1   2    1   1157    754
## 139   0      0   3    1   2197    640
## 140   0      0   4    1   2288    640
## 141  16      1   4    1   2348    754
## 142   0      0   2    1   1320    640
## 143   0      1   2    1   1139    640
## 144   0      1   4    1   2134    639
## 145   0      0   2    1   1407    640
## 146   0      0   2    1   1982    640
## 147   0      0   4    1   2539    640
## 148   0      0   2    1   1528    640
## 149   0      1   2    1   1513    640
## 150   0      1   2    1   1191    640
## 151   0      0   2    1   1280    640
## 152   0      0   2    1   3977    139
## 153   0      1   2    1   1269    640
## 154   0      0   2    1   1501    640
## 155   0      1   2    1   1396    640
## 156   0      0   3    1   1777    640
## 157   0      1   1    1    833    640
## 158   0      1   1    1    715    640
## 159  17      1   5    1   2936    751
## 160   0      0   2    1   1375    640
## 161   0      0   2    1   1330    640
## 162   0      0   2    1   1628    640
## 163   0      0   2    1   1368    640
## 164  12      1   1    1    622    755
## 165  17      0   2    1  14174     23
## 166   7      0   1    1   6425     57
## 167   3      0   1    1   8084     57
## 168   4      1   1    1   6762    347
## 169   0      0  39    1  26356    421
## 170   0      0   2    1   1305    640
## 171   0      0   2    1   1416    640
## 172   0      0   2    1    877    640
## 173  15      1   1    1    622    758
## 174   0      1   4    1   2082    640
## 175   0      1   2    1   1096    640
## 176   0      0   3    1   2028    640
## 177   0      0   2    1   1104    640
## 178   0      1   2    1   1093    640
## 179   0      1   4    1   2592    640
## 180  13      0   1    1   1125    758
## 181   0      0   4    1   3609    640
## 182   0      0   3    1   2118    639
## 183   0      0   2    1   1805    640
## 184   0      0   1    1   2825    580
## 185   0      1   2    1   1299    640
## 186   0      0   2    1   1413    640
```

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## 187   0      1   3    1   2354    640
## 188  16      1   0    1    622    754
## 189   0      1   2    1   1214    640
## 190  17      0   1    1    887    758
## 191   0      1   3    1   1843    640
## 192  16      1   2    1   1275    754
## 193   0      1   4    1   2090    640
## 194   0      1   2    1   1111    640
## 195  15      1   5    1   3102    758
## 196  15      1   1    1    743    758
## 197   0      1   3    1   1505    640
## 198   0      0   2    1   1277    640
## 199   0      1   2    1   1096    640
## 200   0      0   3    1   1828    640
## 201   0      0   2    1   1581    640
## 202  15      0   0    1    607    754
## 203   0      1   2    1   1128    640
## 204   0      0   2    1   1976    640
## 205  17      0   6    1   4227    753
## 206  17      0   5    1   3315    753
## 207   0      0   3    1   2144    640
## 208   0      0   2    1   1283    640
## 209  13      1   2    1   1302    751
## 210   0      1   3    1   1725    640
## 211   0      1   0    1   2847    581
## 212   0      1   3    1   1947    640
## 213   5      0   3    1   7923     53
## 214   0      0   3    1   1669    640
## 215   0      0   3    1   1669    640
## 216  14      1   1    1    707    751
## 217   0      1   2    1   1404    640
## 218   0      0   2    1   1272    640
## 219  14      1   1    1    888    754
## 220   0      1   2    1   1161    640
## 221  16      0   1    1   2112    755
## 222   0      0   2    1   1286    640
## 223   0      0   2    1   1454    640
## 224   0      0   1    1    874    640
## 225  17      0   3    1   1753    750
## 226   0      1   3    1   2129    626
## 227   0      1   3    1   2149    626
## 228  17      1   3    1   1749    753
## 229   0      1   2    1   1317    640
## 230   0      1   2    1   1281    640
## 231  13      0   1    1    607    755
## 232   0      0   3    1   2330    640
## 233   0      0   8    1   5014    640
## 234   0      1   3    1   2029    640
## 235   0      1   3    1   1530    640
## 236   0      0   3    1   2220    626
```

```
## 237   0      0   2    1   1267    640
## 238   0      0   3    1   2057    640
## 239   0      0   2    1   1351    640
## 240   0      1  18    1  10649    626
## 241   0      1   3    1   2777    640
## 242   0      1   3    1   1915    640
## 243   0      0   2    1   1420    640
## 244   0      0   2    1   1337    640
## 245  15      0   6    1  20195     49
## 246   0      1   2    1   1096    640
## 247   0      0   3    1   2187    640
## 248  17      1   3    1   3023     51
## 249   0      1   3    1   1748    640
## 250   0      1   2    1   1141    640
## 251   0      0   3    1   1795    640
## 252   0      1   2    1   1436    640
## 253   0      0   2    1   1156    640
## 254  12      1   3    1   2195    754
## 255   0      0   2    1   1263    640
## 256   0      1   2    1   1324    640
## 257  16      0   1    2   8159    313
## 258   0      0   3    1   1874    640
## 259   0      0   2    1   1538    640
## 260   0      0   4    1   3257    640
## 261   0      1   2    1   1576    633
## 262   0      0  15    1   8631    614
## 263   0      1   2    1   1173    640
## 264  14      0   2    1   2401    753
## 265   0      0   3    1   2516    640
## 266   0      0   2    1   1446    640
## 267   0      0   3    1   1807    640
## 268   0      0   2    1   1307    640
## 269   0      1   2    1   1096    640
## 270   0      0   2    1   1395    640
## 271   0      0   3    1   1739    640
## 272   0      1   2    1   1298    640
## 273   0      0   1    1    921    640
## 274   0      0   7    1   8184    634
## 275   0      1   3    1   2051    640
## 276   0      1   3    1   1743    640
## 277   0      1   2   NA   1156    640
## 278   0      0   2    1   1491    640
## 279   0      0   2    1   1286    640
## 280   0      1   3    1   1772    640
## 281   0      0   2    1   1437    640
## 282   0      1   4    1   2724    640
## 283   0      0   2    2   1291    640
## 284   0      1   2    1   1211    640
## 285   0      1   2    1   1096    640
## 286   0      0   2    1   1280    640
```

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## 287  13      1   1    1    735    755
## 288   0      0   2    1   1280    640
## 289   0      0   2    1   1383    640
## 290   0      1   3    1   1660    640
## 291   0      0   2    1   1458    640
## 292   0      0   2    1   1427    640
## 293   0      1   2    1   1217    640
## 294   0      1   2    1   1096    640
## 295   0      1   2    1   1099    640
## 296  16      1   2    1   2711    812
## 297   0      1   2    1   1099    640
## 298   0      0   1    1    871    640
## 299  17      0   2    1   1418    753
## 300  17      1   4    1   2936    751
## 301  16      0   1    1   2543    420
## 302  17      0   1    1   4833    952
## 303  16      1   0    1   2570    811
## 304  16      0   2    2  10002     21
## 305  16      0   2    1   1385    758
## 306  16      1   3    1   6692     53
## 307  15      1   1    1    783    758
## 308  15      1   4    1   2255    751
## 309  15      0   1    1  12024     92
## 310  15      0   3    1   2089    751
## 311  14      1   1    1    627    755
## 312  14      1   2    1   1321    751
## 313  14      1   1    1    763    755
## 314  17      1   3    1   1688    751
## 315  13      1   1    1   1760    751
## 316  13      1   2    1   1306    754
## 317  13      1   6    1   3674    758
## 318  12      1   2    1   1348    753
## 319  12      0   1    1    622    755
## 320  12      0   1    1    767    755
## 321  11      0   1    1   1178    422
## 322  11      0   1    1    869    756
## 323  10      0   7    1  17524    317
## 324  14      1   1    1    625    756
## 325   8      0   1    1   3588    139
## 326  10      0   0    1   2925    344
## 327   9      0   3    1  10562    114
## 328  17      1   2    1   1436    758
## 329   4      0   3    1   9230    206
## 330  14      0   4    1  10756     53
## 331  15      0  18    1  11685    753
## 332   1      1   1    1   1711    723
## 333  17      1   7    1  48388    911
## 334  17      1   1    1    851     54
## 335  15      1   1    1    634    753
## 336  14      1   6    1   3656    753
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```
## 337  17      1   1    1    616    753
## 338   0      1   1    1   1688    138
## 339  15      0   9    1  16520    225
## 340  12      1   3    1   1786    753
## 341  14      1   1    1    972    751
## 342   1      0   1    1   2117     58
## 343   1      0   2    1   8050     53
## 344  17      1   4    1   9932     53
## 345  16      1   2    1   1422    753
## 346  16      1   2    1   1381    753
## 347   0      1   3    1   2877    422
## 348   0      0   1    1   2805    138
## 349   0      0   2    1   4412    138
## 350  15      1   5    1  11125    740
## 351   0      1   2    1   1818    249
## 352   0      0   5    1   4296    640
## 353   0      0   3    1   1887    640
## 354   0      1   2    1   1418    640
## 355   0      1   2    1   1136    640
## 356   0      1   2    1   1475    640
## 357   0      1   2    1   1099    640
## 358   0      1   3    1   1538    640
## 359   1      0   2    1   1651    249
## 360  17      1   1    1   1106    753
## 361   0      0   1    1   1097    640
## 362  13      0   2    1   1273    754
## 363   0      1   2    1   1362    640
## 364   0      0   3    1   3342    640
## 365  12      1   5    1  11877    344
## 366  16      1   1    1    547    754
## 367   0      0   6    1   5568    640
## 368   0      1   7    1   4288    639
## 369   0      1   7    1   5788    614
## 370  16      1   4    1   2238    754
## 371   0      0   2    1   1283    640
## 372   0      1   0    1   2531    581
## 373   0      1  23    1  13112    614
## 374   0      0   3    1   3497    640
## 375   0      0   3    1   1832    640
## 376   0      1   3    1   1685    640
## 377   0      0   2    1   1135    640
## 378   0      1   2    1   1156    640
## 379  13      1   1    1    548    751
## 380   0      1   2    1   1303    640
## 381   0      1   3    1   1890    640
## 382  11      0   2    1   1285    753
## 383   0      0   3    1   1674    640
## 384   0      1   2    1   1128    640
## 385   0      0   4    1   2595    640
## 386   0      0   3    1   1782    640
```

```
## 387   0      1   2    1   1251    640
## 388   0      0   3    1   1997    640
## 389  16      1   1    1    532    755
## 390   0      0   2    1   1758    640
## 391   0      0   2    1   1369    640
## 392   0      0   2    1   1096    640
## 393   0      0   2    1   1477    640
## 394  16      1   1    1    840    753
## 395   0      0   2    1   1340    640
## 396   0      0   2    1   1236    640
## 397   0      0   5    1   4677    640
## 398  17      0   2    1   3285    754
## 399   9      0   1    1  10585    308
## 400  12      0   3    1   1808    753
## 401   0      0   1    1   1051    640
## 402  16      1   3    1   2201    758
## 403   0      1   4    3   3041    626
## 404   0      0   1    1    550    640
## 405   0      1   2    1   1156    640
## 406  17      1   1    1   3800    753
## 407   0      0   2    1   1039    640
## 408   0      1   3    1   1769    633
## 409   0      0   2    1   1794    640
## 410   0      0   2    1   1578    640
## 411   8      0   2    2   1153    758
## 412   0      0   3    1   1883    640
## 413   0      0   2    6   1535    640
## 414   0      1   2    1   1200    640
## 415   0      1   3    1   1946    640
## 416   0      1   2    1   1875    640
## 417   0      1   3    1   1908    640
## 418   0      0   3    1   2080    640
## 419   0      0   2    1   1408    640
## 420   0      0   3    1   2008    640
## 421  17      0   4    1   2977    754
## 422   0      0   2    1   1278    640
## 423   0      0   2    1   1408    640
## 424   0      1   2    1   1083    640
## 425   0      0   3    1   1964    640
## 426   0      0   2    1   1231    640
## 427   0      0   3    1   1845    640
## 428   0      0   2    1   1428    640
## 429  14      1   5    4   2735    753
## 430   0      1   7    1   5934    640
## 431   0      1   3    1   1888    640
## 432   0      1   3    1   1431    640
## 433  14      0   2    1   9129    225
## 434   0      0   1    1    651    640
## 435   0      1   4    1   3969    640
## 436   0      0   2    1   1363    640
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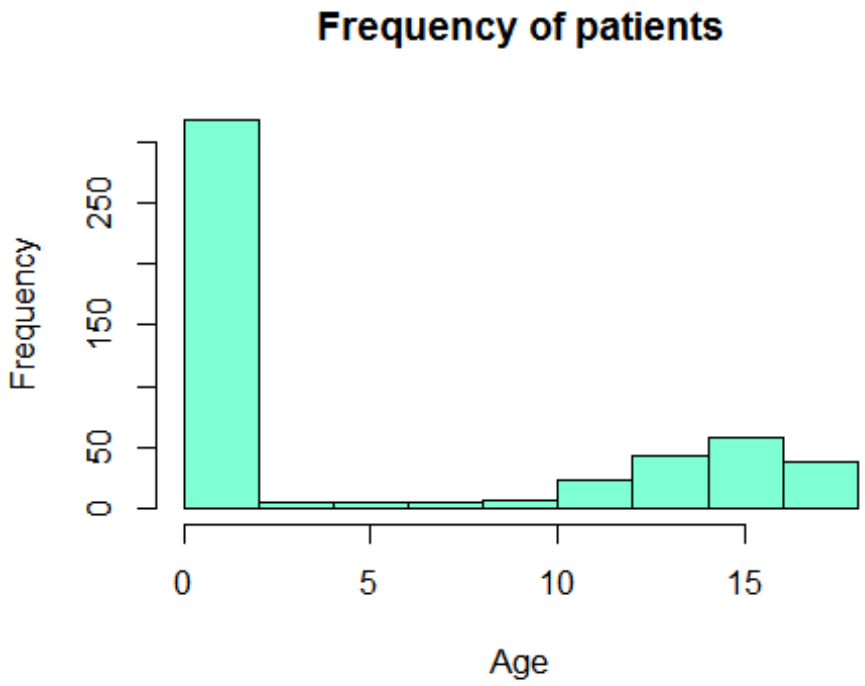
```
## 437   0      1   2    1   1118    640
## 438   0      1   2    1   1543    640
## 439  14      0   1    1    678    754
## 440  14      1   2    1   1463    760
## 441  17      0   3    1   8439    204
## 442   0      1   5    1   4304    640
## 443   0      1   3    1   1890    640
## 444   0      0   3    1   1933    640
## 445   0      1   2    1   1281    640
## 446  10      1   2    1   1160    753
## 447   0      0   2    1   1120    640
## 448  16      1   2    1   1164    754
## 449   0      1   2    1   1083    640
## 450   0      0   2    1   1465    640
## 451   0      1   2    1   1083    640
## 452   0      0   2    1   1768    634
## 453  14      1   4    1   2296    561
## 454   0      0   2    1   1284    640
## 455  13      1   4    1   2632    758
## 456   0      0   3    1   1952    640
## 457   0      0   4    1   2100    640
## 458  17      1   2    1   2217    560
## 459   0      0   2    1   1281    640
## 460   0      1   2    1   1250    640
## 461   6      0   2    1   8398    115
## 462   0      0   2    1   1263    640
## 463   0      1   2    1   1178    640
## 464   0      1  24    1  13040    863
## 465   0      1   3    1   1517    640
## 466   0      0   3    4   3126    640
## 467   0      1   4    1   2049    640
## 468   0      0   2    1   1245    640
## 469  16      0   1    1   3578    723
## 470   0      1   3    1   1603    640
## 471   0      1   3    1   2840    640
## 472   0      1   2    1   1411    640
## 473   0      1   2    1   1175    640
## 474   0      0   2    1   1689    640
## 475   0      1   3    1   2023    640
## 476  12      0   2    1   1310    753
## 477   0      0   2    1   2540    640
## 478   0      0   7    1  10431    636
## 479   0      0   3    1   2204    633
## 480   0      0   3    1   2218    640
## 481   0      0   2    1   1382    640
## 482   0      1   2    1   1115    640
## 483  11      0   1    1    629    753
## 484   0      0   1    1    825    640
## 485   0      0   3    1   1701    640
## 486   0      0   2    1   1273    640
```

```
## 487   0      0   2    1   1270    640
## 488   0      1   2    1   1106    640
## 489   0      1   2    1   1065    640
## 490   0      0   2    1   1264    640
## 491   0      0   2    1   1282    640
## 492   0      0   2    1   1393    640
## 493  15      1   4    2   3074    758
## 494   0      0   2    1   1266    640
## 495   0      1   3    1   1886    640
## 496   0      1   6    1   5881    636
## 497   0      1   2    1   1171    640
## 498   0      1   2    1   1171    640
## 499   0      1   2    1   1086    640
## 500   0      0   4    1   4931    640
```

```
##1Record patient stats-frequency of patients and max expenditure
hist(hosp$AGE,main = "Frequency of patients",col = "aquamarine",xlab = "Age")
```




```
attach(hosp)
AGE<-as.factor(AGE)
summary(AGE)#Thus infants have max hospital visits
```

```
##   0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17
## 307  10   1   3   2   2   2   3   2   2   4   8  15  18  25  29  29  38
```

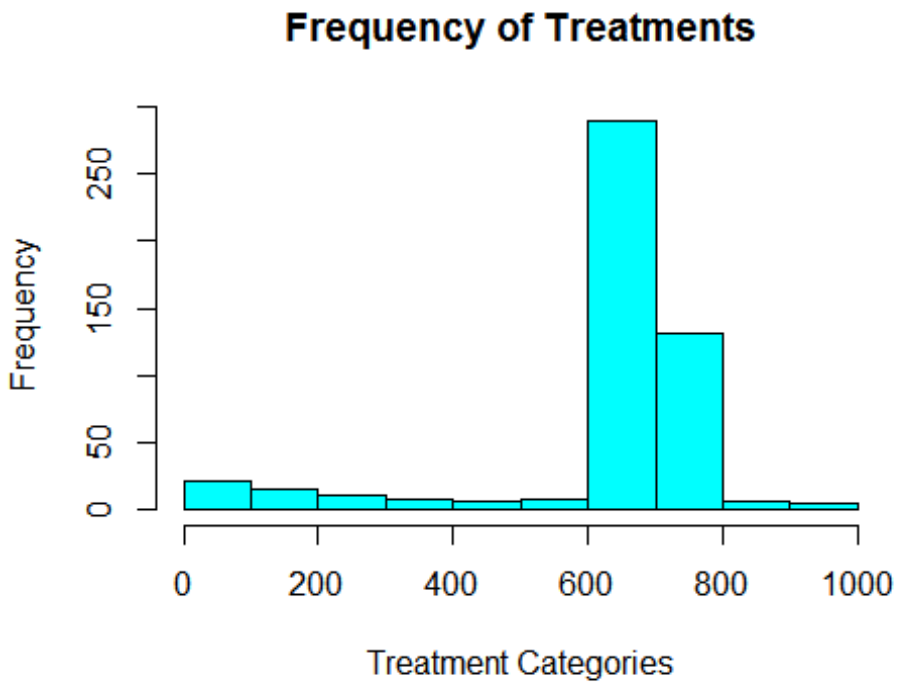
```
aggregate(TOTCHG~AGE,FUN=sum,data = hosp)
```

```
##    AGE TOTCHG
## 1    0 678118
## 2    1  37744
## 3    2   7298
## 4    3  30550
## 5    4  15992
## 6    5  18507
## 7    6  17928
## 8    7  10087
## 9    8   4741
## 10   9  21147
## 11  10  24469
## 12  11  14250
## 13  12  54912
## 14  13  31135
## 15  14  64643
## 16  15 111747
## 17  16  69149
## 18  17 174777
```

```
max(aggregate(TOTCHG~AGE,FUN=sum,data=hosp))
```

```
## [1] 678118
```

```
#2.Most Expensive Treatments
hist(APRDRG,col = "cyan1",main = "Frequency of Treatments",xlab = "Treatment
Categories")
```



```
APRDRG_fact<-as.factor(hosp$APRDRG)
summary(APRDRG_fact)
```

```
##  21  23  49  50  51  53  54  57  58  92  97 114 115 137 138 139 141 143
##   1   1   1   1   1  10   1   2   1   1   1   1   2   1   4   5   1   1
## 204 206 225 249 254 308 313 317 344 347 420 421 422 560 561 566 580 581
##   1   1   2   6   1   1   1   1   2   3   2   1   3   2   1   1   1   3
## 602 614 626 633 634 636 639 640 710 720 723 740 750 751 753 754 755 756
##   1   3   6   4   2   3   4 267   1   1   2   1   1  14  36  37  13   2
## 758 760 776 811 812 863 911 930 952
##  20   2   1   2   3   1   1   2   1
```

```
which.max(summary(APRDRG_fact))
```

```
## 640
##  44
```

```
df<-aggregate(TOTCHG~APRDRG,FUN = sum,data=hosp)
df
```

```
##    APRDRG TOTCHG
## 1      21  10002
## 2      23  14174
## 3      49  20195
## 4      50   3908
## 5      51   3023
## 6      53  82271
## 7      54    851
## 8      57  14509
## 9      58   2117
## 10     92  12024
## 11     97   9530
## 12    114  10562
## 13    115  25832
## 14    137  15129
## 15    138  13622
## 16    139  17766
## 17    141   2860
## 18    143   1393
## 19    204   8439
## 20    206   9230
## 21    225  25649
## 22    249  16642
## 23    254    615
## 24    308  10585
## 25    313   8159
## 26    317  17524
## 27    344  14802
## 28    347  12597
## 29    420   6357
## 30    421  26356
```

```
## 31    422   5177
## 32    560   4877
## 33    561   2296
## 34    566   2129
## 35    580   2825
## 36    581   7453
## 37    602  29188
## 38    614  27531
## 39    626  23289
## 40    633  17591
## 41    634   9952
## 42    636  23224
## 43    639  12612
## 44    640 437978
## 45    710   8223
## 46    720  14243
## 47    723   5289
## 48    740  11125
## 49    750   1753
## 50    751  21666
## 51    753  79542
## 52    754  59150
## 53    755  11168
## 54    756   1494
## 55    758  34953
## 56    760   8273
## 57    776   1193
## 58    811   3838
## 59    812   9524
## 60    863  13040
## 61    911  48388
## 62    930  26654
## 63    952   4833
```

```
df[which.max(df$TOTCHG),]#category 640 has the highest hospitaliation
frequency and cost.
```

```
##    APRDRG TOTCHG
## 44    640 437978
```

```
#3.Analyze if race of patients is related to costs
hosp<-na.omit(hosp)#first we remove "NA"values
hosp$RACE<-as.factor(hosp$RACE)
model_aov<-aov(TOTCHG~RACE,data = hosp)
model_aov#ANOVA RESULTS
```

```
## Call:
##    aov(formula = TOTCHG ~ RACE, data = hosp)
##
## Terms:
##                       RACE  Residuals
```

```
## Sum of Squares    18593279 7523518505
## Deg. of Freedom          5        493
##
## Residual standard error: 3906.493
## Estimated effects may be unbalanced
```

```
summary(model_aov)
```

```
##              Df    Sum Sq  Mean Sq F value Pr(>F)
## RACE          5 1.859e+07  3718656   0.244  0.943
## Residuals   493 7.524e+09 15260687
```

```
summary(hosp$RACE)#getting max hospital cost per race
```

```
##   1   2   3   4   5   6
## 484   6   1   3   3   2
```

```
#4.Analyze severity of hospital cost by Age and gender
hosp$FEMALE<-as.factor(hosp$FEMALE)
model_lm4<-lm(TOTCHG~AGE+FEMALE,data = hosp)#calling Regression funtion
summary(model_lm4)
```

```
##
## Call:
## lm(formula = TOTCHG ~ AGE + FEMALE, data = hosp)
##
## Residuals:
##    Min     1Q Median     3Q    Max
##  -3403  -1444   -873   -156  44950
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  2719.45     261.42  10.403  < 2e-16 ***
## AGE            86.04      25.53   3.371 0.000808 ***
## FEMALE1      -744.21     354.67  -2.098 0.036382 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 3849 on 496 degrees of freedom
## Multiple R-squared:  0.02585,    Adjusted R-squared:  0.02192
## F-statistic: 6.581 on 2 and 496 DF,  p-value: 0.001511
```

```
summary(hosp$FEMALE)#comapring genders
```

```
##   0   1
## 244 255
```

```
#5.Analyze whether length of stay(LOS) is realted to age,gender and race
hosp$RACE<-as.factor(hosp$RACE)
model_lm5<-lm(LOS~AGE+FEMALE+RACE,data = hosp)
summary(model_lm5)
```

```
##
## Call:
## lm(formula = LOS ~ AGE + FEMALE + RACE, data = hosp)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -3.211 -1.211 -0.857  0.143 37.789
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  2.85687    0.23160  12.335   <2e-16 ***
## AGE         -0.03938    0.02258  -1.744   0.0818 .
## FEMALE1      0.35391    0.31292   1.131   0.2586
## RACE2       -0.37501    1.39568  -0.269   0.7883
## RACE3        0.78922    3.38581   0.233   0.8158
## RACE4        0.59493    1.95716   0.304   0.7613
## RACE5       -0.85687    1.96273  -0.437   0.6626
## RACE6       -0.71879    2.39295  -0.300   0.7640
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 3.376 on 491 degrees of freedom
## Multiple R-squared:  0.008699,   Adjusted R-squared:  -0.005433
## F-statistic: 0.6156 on 7 and 491 DF,  p-value: 0.7432
```

```
#6.Variable that mainly affect hospitalization cost
model_lm6<-lm(TOTCHG~AGE+FEMALE+RACE+LOS+APRDRG,data = hosp)
summary(model_lm6)
```

```
##
## Call:
## lm(formula = TOTCHG ~ AGE + FEMALE + RACE + LOS + APRDRG, data = hosp)
##
## Residuals:
##    Min     1Q Median     3Q    Max
##  -6367   -691   -186    121  43412
##
## Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)  5024.9610   440.1366  11.417  < 2e-16 ***
## AGE           133.2207    17.6662   7.541 2.29e-13 ***
## FEMALE1      -392.5778   249.2981  -1.575    0.116
## RACE2         458.2427  1085.2320   0.422    0.673
## RACE3         330.5184  2629.5121   0.126    0.900
## RACE4        -499.3818  1520.9293  -0.328    0.743
## RACE5       -1784.5776  1532.0048  -1.165    0.245
## RACE6        -594.2921  1859.1271  -0.320    0.749
## LOS           742.9637    35.0464  21.199  < 2e-16 ***
## APRDRG         -7.8175     0.6881 -11.361  < 2e-16 ***
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 2622 on 489 degrees of freedom
## Multiple R-squared:  0.5544, Adjusted R-squared:  0.5462
## F-statistic:  67.6 on 9 and 489 DF,  p-value: < 2.2e-16
```