# MATH 3070 Lab Project 5

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*Remember: I expect to see commentary either in the text, in the code with comments created using `#`, or (preferably) both!* **Failing to do so may result in lost points!**

## Problem 1 (Verzani problem 4.7)

*Use the `subset()` function to return a data frame made from the `Cars93` (**MASS**) data frame consisting only of `non-USA` cars in origin, with 4 cylinders and a maximum price of $15,000 or less.*

```
# Your code here
library(MASS)
View(Cars93)
```

```
## Error in check_for_XQuartz(): X11 library is missing: install XQuartz from xquartz.macosforge.org
```

```
subset(Cars93, select = c(Origin, Cylinders, Max.Price), Origin == "non-USA" &
    Cylinders == 4 & Max.Price <= 15)
```

```
##      Origin Cylinders Max.Price
## 40 non-USA         4      13.5
## 44 non-USA         4       9.2
## 45 non-USA         4      11.0
## 46 non-USA         4      11.0
## 53 non-USA         4       9.1
## 54 non-USA         4      12.3
## 62 non-USA         4      12.9
## 64 non-USA         4      14.9
## 81 non-USA         4      11.3
## 84 non-USA         4      11.8
## 88 non-USA         4       9.5
```

## Problem 2 (Verzani problem 4.10)

*Find the standard deviation of each variable in the `mtcars` data set.*

```
# Your code here
View(mtcars)
```

```
## Error in check_for_XQuartz(): X11 library is missing: install XQuartz from xquartz.macosforge.org
```

```
sapply(mtcars, sd)
```

```
##        mpg         cyl        disp          hp        drat          wt
##  6.0269481   1.7859216 123.9386938  68.5628685   0.5346787   0.9784574
##       qsec          vs          am        gear        carb
##  1.7869432   0.5040161   0.4989909   0.7378041   1.6152000
```

## Problem 3 (Verzani problem 4.11)

*Find the standard deviation for each numeric variable in `Cars93` (**MASS**).*

```
# Your code here
library(MASS)
# View(Cars93)
sapply(Cars93[sapply(Cars93, is.numeric)], sd)
```

```
##           Min.Price           Price          Max.Price
##            8.746029          9.659430         11.030457
##            MPG.city        MPG.highway        EngineSize
##            5.619812          5.331726          1.037363
##          Horsepower             RPM         Rev.per.mile
##           52.374410        596.731690        496.506525
## Fuel.tank.capacity       Passengers            Length
##            3.279370          1.038979         14.602382
##           Wheelbase           Width           Turn.circle
##            6.819674          3.778986          3.223265
##       Rear.seat.room      Luggage.room         Weight
##                  NA               NA         589.896510
```

# Problem 4

*You can find data describing various statistics on 2012 Olympic participating nations such as population and medal counts in the comma-separated value file located here:* `http://introcs.cs.princeton.edu/java/data/olympic-medals2012.csv` *Load this dataset into R in a data frame and do the following:*

1.  *Create a new data frame containing only the country's ISO code (a three-letter code for the country; USA is the United States of America, and DZA Algeria), name, population, and counts for gold, silver, and bronze. This data frame should be called* `olympic2012`.

```
# Your code here

x <- read.csv("http://introcs.cs.princeton.edu/java/data/olympic-medals2012.csv")
# View(energy)

olympic2012 <- subset(x, selec = c(ISO, Country.name, pop.2010, Gold, Silver,
    Bronze))
olympic2012
```

```
##      ISO               Country.name       pop.2010 Gold Silver Bronze
## 1    AFG                Afghanistan     34,385,000    0      0      1
## 2    ALB                    Albania      3,205,000    0      0      0
## 3    DZA                    Algeria     35,468,000    1      0      0
## 4    ASM             American Samoa         68,420    0      0      0
## 5    AND                    Andorra         84,864    0      0      0
## 6    AGO                     Angola     19,082,000    0      0      0
## 7    ATG        Antigua and Barbuda         88,000    0      0      0
## 8    ARG                  Argentina     40,412,000    1      1      2
## 9    ARM                    Armenia      3,092,000    0      1      2
## 10   ABW                      Aruba        108,000    0      0      0
## 11   AUS                  Australia     22,299,000    7     16     12
## 12   AUT                    Austria      8,390,000    0      0      0
## 13   AZE                 Azerbaijan      9,054,000    2      2      6
## 14   BHS                    Bahamas        343,000    1      0      0
## 15   BHR                    Bahrain      1,262,000    0      0      1
## 16   BGD                 Bangladesh    148,692,000    0      0      0
## 17   BRB                   Barbados        274,000    0      0      0
## 18   BLR                    Belarus      9,490,000    2      5      5
## 19   BEL                    Belgium     10,896,000    0      1      2
## 20   BLZ                     Belize        345,000    0      0      0
## 21   BEN                      Benin      8,850,000    0      0      0
## 22   BMU                    Bermuda         64,600    0      0      0
## 23   BTN                     Bhutan        726,000    0      0      0
## 24   BOL                    Bolivia      9,929,000    0      0      0
## 25   BIH     Bosnia and Herzegovina      3,760,000    0      0      0
## 26   BWA                   Botswana      2,007,000    0      1      0
## 27   BRA                     Brazil    194,946,000    3      5      9
## 28   VGB      British Virgin Islands         88,000    0      0      0
## 29   BRN                     Brunei        399,000    0      0      0
## 30   BGR                   Bulgaria      7,534,000    0      1      1
## 31   BFA               Burkina Faso     16,468,000    0      0      0
```

```
## 32  MMR                            Burma    47,963,000     0     0     0
## 33  BDI                          Burundi     8,382,000     0     0     0
## 34  KHM                         Cambodia    14,139,000     0     0     0
## 35  CMR                         Cameroon    19,599,000     0     0     0
## 36  CAN                           Canada    34,126,000     1     5    12
## 37  CPV                       Cape Verde       496,000     0     0     0
## 38  CYM                   Cayman Islands        56,230     0     0     0
## 39  CAF         Central African Republic     4,401,000     0     0     0
## 40  TCD                             Chad    11,227,000     0     0     0
## 41  CHL                            Chile    17,113,688     0     0     0
## 42  CHN                     China 1,338,300,000    38    27    23
## 43  COL                         Colombia    46,295,000     1     3     4
## 44  COM                          Comoros       735,000     0     0     0
## 45  COG               Congo-Brazzaville     4,043,000     0     0     0
## 46  COK                     Cook Islands        20,000     0     0     0
## 47  CRI                       Costa Rica     4,659,000     0     0     0
## 48  HRV                          Croatia     4,418,000     3     1     2
## 49  CUB                             Cuba    11,258,000     5     3     6
## 50  CYP                           Cyprus       659,350     0     1     0
## 51  CZE                   Czech Republic    10,520,000     4     3     3
## 52  COD     Democratic Republic of Congo    65,965,000     0     0     0
## 53  DNK                          Denmark     5,547,000     2     4     3
## 54  DJI                         Djibouti       889,000     0     0     0
## 55  DMA                         Dominica        68,000     0     0     0
## 56  DOM               Dominican Republic     9,927,000     1     1     0
## 57  TLS                       East Timor     1,124,000     0     0     0
## 58  ECU                          Ecuador    14,465,000     0     0     0
## 59  EGY                            Egypt    81,121,000     0     2     0
## 60  SLV                      El Salvador     6,193,000     0     0     0
## 61  GNQ                Equatorial Guinea       700,000     0     0     0
## 62  ERI                          Eritrea     5,254,000     0     0     0
## 63  EST                          Estonia     1,340,000     0     1     1
## 64  ETH                         Ethiopia    82,950,000     3     1     3
## 65  FJI                             Fiji       860,000     0     0     0
## 66  FIN                          Finland     5,364,000     0     1     2
## 67  FRA                           France    64,895,000    11    11    12
## 68  GAB                            Gabon     1,505,000     0     1     0
## 69  GMB                           Gambia     1,729,000     0     0     0
## 70  GEO                          Georgia     4,452,000     1     3     3
## 71  DEU                          Germany    81,777,000    11    19    14
## 72  GHA                            Ghana    24,392,000     0     0     0
## 73  GRC                           Greece    11,316,000     0     0     2
## 74  GRD                          Grenada       104,000     1     0     0
## 75  GUM                             Guam       179,000     0     0     0
## 76  GTM                        Guatemala    14,389,000     0     1     0
## 77  GIN                           Guinea     9,982,000     0     0     0
## 78  GNB                    Guinea-Bissau     1,515,000     0     0     0
## 79  GUY                           Guyana       755,000     0     0     0
## 80  HTI                            Haiti     9,993,000     0     0     0
## 81  HND                         Honduras     7,600,000     0     0     0
## 82  HKG                        Hong Kong     7,068,000     0     0     1
## 83  HUN                          Hungary    10,000,000     8     4     5
## 84  ISL                          Iceland       318,000     0     0     0
## 85  IND                     India 1,224,615,000     0     2     4
## 86  IDN                        Indonesia   239,870,000     0     1     1
## 87  IRN                             Iran    73,973,000     4     5     3
## 88  IRQ                             Iraq    32,031,000     0     0     0
## 89  IRL                          Ireland     4,475,000     1     1     3
## 90  ISR                           Israel     7,624,000     0     0     0
## 91  ITA                            Italy    60,483,000     8     9    11
## 92  CIV                      Ivory Coast    19,738,000     0     0     0
## 93  JAM                          Jamaica     2,702,000     4     4     4
## 94  JPN                            Japan   127,451,000     7    14    17
## 95  JOR                           Jordan     6,047,000     0     0     0
## 96  KAZ                       Kazakhstan    16,323,000     7     1     5
## 97  KEN                            Kenya    40,513,000     2     4     5
## 98  KIR                         Kiribati       100,000     0     0     0
## 99  KWT                           Kuwait     2,736,000     0     0     1
## 100 KGZ                       Kyrgyzstan     5,448,000     0     0     0
## 101 LAO                             Laos     6,201,000     0     0     0
## 102 LVA                           Latvia     2,239,000     1     0     1
## 103 LBN                          Lebanon     4,227,000     0     0     0
## 104 LSO                          Lesotho     2,171,000     0     0     0
```

```
## 105 LBR                              Liberia   3,994,000   0    0    0
## 106 LBY                                Libya    6,355,000   0    0    0
## 107 LIE                        Liechtenstein      36,032    0    0    0
## 108 LTU                            Lithuania    3,287,000   2    1    2
## 109 LUX                           Luxembourg      507,000    0    0    0
## 110 MKD                            Macedonia    2,060,000    0    0    0
## 111 MDG                           Madagascar   20,714,000    0    0    0
## 112 MWI                               Malawi   14,901,000    0    0    0
## 113 MYS                             Malaysia   28,401,000    0    1    1
## 114 MDV                             Maldives      316,000    0    0    0
## 115 MLI                                 Mali   15,370,000    0    0    0
## 116 MLT                                Malta      416,000    0    0    0
## 117 MHL                      Marshall Islands      54,038    0    0    0
## 118 MRT                           Mauritania    3,460,000    0    0    0
## 119 MUS                            Mauritius    1,281,000    0    0    0
## 120 MEX                               Mexico  113,423,000    1    3    3
## 121 FSM                           Micronesia      111,000    0    0    0
## 122 MDA                              Moldova    3,562,000    0    0    2
## 123 MCO                               Monaco       35,407    0    0    0
## 124 MNG                             Mongolia    2,756,000    0    2    3
## 125 MNE                           Montenegro      632,000    0    1    0
## 126 MAR                              Morocco   31,951,000    0    0    1
## 127 MOZ                           Mozambique   23,390,000    0    0    0
## 128 NAM                              Namibia    2,283,000    0    0    0
## 129 NRU                                Nauru       10,372    0    0    0
## 130 NPL                                Nepal   29,959,000    0    0    0
## 131 NLD                          Netherlands   16,616,000    6    6    8
## 132 NZL                          New Zealand    4,368,000    6    2    5
## 133 NIC                            Nicaragua    5,789,000    0    0    0
## 134 NER                                Niger   15,512,000    0    0    0
## 135 NGA                              Nigeria  158,423,000    0    0    0
## 136 PRK                          North Korea   24,589,122    4    0    2
## 137 NOR                               Norway    4,889,000    2    1    1
## 138 OMN                                 Oman    2,783,000    0    0    0
## 139 PAK                             Pakistan  173,593,000    0    0    0
## 140 PLW                                Palau       20,472    0    0    0
## 141 PSE                            Palestine    4,152,000    0    0    0
## 142 PAN                               Panama    3,517,000    0    0    0
## 143 PNG                     Papua New Guinea    6,858,000    0    0    0
## 144 PRY                             Paraguay    6,454,000    0    0    0
## 145 PER                                 Peru   29,076,000    0    0    0
## 146 PHL                          Philippines   93,261,000    0    0    0
## 147 POL                               Poland   38,184,000    2    2    6
## 148 PRT                             Portugal   10,638,000    0    1    0
## 149 PRI                          Puerto Rico    3,978,000    0    1    1
## 150 QAT                                Qatar    1,759,000    0    0    2
## 151 ROU                              Romania   21,438,000    2    5    2
## 152 RUS                               Russia  141,750,000   24   26   32
## 153 RWA                               Rwanda   10,624,000    0    0    0
## 154 KNA                Saint Kitts and Nevis       52,000    0    0    0
## 155 LCA                          Saint Lucia      174,000    0    0    0
## 156 VCT Saint Vincent and the Grenadines      109,000    0    0    0
## 157 WSM                                Samoa      184,000    0    0    0
## 158 SMR                           San Marino       31,534    0    0    0
## 159 STP                Sao Tome and Principe      165,000    0    0    0
## 160 SAU                         Saudi Arabia   27,448,000    0    0    1
## 161 SEN                              Senegal   12,434,000    0    0    0
## 162 SRB                               Serbia    7,291,000    1    1    2
## 163 SYC                           Seychelles       87,000    0    0    0
## 164 SLE                         Sierra Leone    5,867,000    0    0    0
## 165 SGP                            Singapore    5,077,000    0    0    2
## 166 SVK                             Slovakia    5,430,000    0    1    3
## 167 SVN                             Slovenia    2,049,000    1    1    2
## 168 SLB                      Solomon Islands      538,000    0    0    0
## 169 SOM                              Somalia    9,331,000    0    0    0
## 170 ZAF                         South Africa   49,991,000    3    2    1
## 171 KOR                          South Korea   48,875,000   13    8    7
## 172 ESP                                Spain   46,071,000    3   10    4
## 173 LKA                            Sri Lanka   20,860,000    0    0    0
## 174 SDN                                Sudan   43,552,000    0    0    0
## 175 SUR                              Surinam      525,000    0    0    0
## 176 SWZ                            Swaziland    1,056,000    0    0    0
## 177 SWE                               Sweden    9,378,000    1    4    3
```

```
## 178 CHE                Switzerland    7,826,000    2    2    0
## 179 SYR                     Syria   20,447,000    0    0    0
## 180 TWN                    Taiwan   23,174,528    0    1    1
## 181 TJK                Tajikistan    6,879,000    0    0    1
## 182 TZA                  Tanzania   44,841,000    0    0    0
## 183 THA                  Thailand   69,122,000    0    2    1
## 184 TGO                      Togo    6,028,000    0    0    0
## 185 TON                     Tonga      104,000    0    0    0
## 186 TTO       Trinidad and Tobago    1,341,000    1    0    3
## 187 TUN                   Tunisia   10,549,000    1    1    1
## 188 TUR                    Turkey   72,752,000    2    2    1
## 189 TKM              Turkmenistan    5,042,000    0    0    0
## 190 TUV                    Tuvalu        9,827    0    0    0
## 191 UGA                    Uganda   33,424,000    1    0    0
## 192 GBR                        UK   62,232,000   29   17   19
## 193 UKR                   Ukraine   45,871,000    6    5    9
## 194 ARE      United Arab Emirates    7,512,000    0    0    0
## 195 URY                   Uruguay    3,357,000    0    0    0
## 196 USA                        US  309,349,000   46   29   29
## 197 UZB                Uzbekistan   28,228,000    1    0    3
## 198 VUT                   Vanuatu      240,000    0    0    0
## 199 VEN                 Venezuela   28,834,000    1    0    0
## 200 VNM                   Vietnam   86,928,000    0    0    0
## 201 VIR             Virgin Islands     110,000    0    0    0
## 202 YEM                     Yemen   24,053,000    0    0    0
## 203 ZMB                    Zambia   12,927,000    0    0    0
## 204 ZWE                  Zimbabwe   12,571,000    0    0    0
```

2.  What proportion of countries earned no medals? Answer this using `olympic2012`.

```
# Your code here
olympic2012
```

```
##     ISO                Country.name  pop.2010 Gold Silver Bronze
## 1   AFG                 Afghanistan 34,385,000    0    0    1
## 2   ALB                     Albania  3,205,000    0    0    0
## 3   DZA                     Algeria 35,468,000    1    0    0
## 4   ASM               American Samoa    68,420    0    0    0
## 5   AND                     Andorra     84,864    0    0    0
## 6   AGO                      Angola 19,082,000    0    0    0
## 7   ATG         Antigua and Barbuda     88,000    0    0    0
## 8   ARG                   Argentina 40,412,000    1    1    2
## 9   ARM                     Armenia  3,092,000    0    1    2
## 10  ABW                       Aruba    108,000    0    0    0
## 11  AUS                   Australia 22,299,000    7   16   12
## 12  AUT                     Austria  8,390,000    0    0    0
## 13  AZE                  Azerbaijan  9,054,000    2    2    6
## 14  BHS                     Bahamas    343,000    1    0    0
## 15  BHR                     Bahrain  1,262,000    0    0    1
## 16  BGD                  Bangladesh 148,692,000    0    0    0
## 17  BRB                    Barbados    274,000    0    0    0
## 18  BLR                     Belarus  9,490,000    2    5    5
## 19  BEL                     Belgium 10,896,000    0    1    2
## 20  BLZ                      Belize    345,000    0    0    0
## 21  BEN                       Benin  8,850,000    0    0    0
## 22  BMU                     Bermuda     64,600    0    0    0
## 23  BTN                      Bhutan    726,000    0    0    0
## 24  BOL                     Bolivia  9,929,000    0    0    0
## 25  BIH      Bosnia and Herzegovina  3,760,000    0    0    0
## 26  BWA                    Botswana  2,007,000    0    1    0
## 27  BRA                      Brazil 194,946,000    3    5    9
## 28  VGB       British Virgin Islands    88,000    0    0    0
## 29  BRN                      Brunei    399,000    0    0    0
## 30  BGR                    Bulgaria  7,534,000    0    1    1
## 31  BFA                Burkina Faso 16,468,000    0    0    0
## 32  MMR                       Burma 47,963,000    0    0    0
## 33  BDI                     Burundi  8,382,000    0    0    0
## 34  KHM                    Cambodia 14,139,000    0    0    0
## 35  CMR                    Cameroon 19,599,000    0    0    0
## 36  CAN                      Canada 34,126,000    1    5   12
## 37  CPV                  Cape Verde    496,000    0    0    0
```

```
## 38  CYM                  Cayman Islands        56,230    0    0    0
## 39  CAF      Central African Republic       4,401,000    0    0    0
## 40  TCD                           Chad      11,227,000    0    0    0
## 41  CHL                          Chile      17,113,688    0    0    0
## 42  CHN                          China   1,338,300,000   38   27   23
## 43  COL                       Colombia      46,295,000    1    3    4
## 44  COM                        Comoros         735,000    0    0    0
## 45  COG             Congo-Brazzaville       4,043,000    0    0    0
## 46  COK                   Cook Islands          20,000    0    0    0
## 47  CRI                     Costa Rica       4,659,000    0    0    0
## 48  HRV                        Croatia       4,418,000    3    1    2
## 49  CUB                           Cuba      11,258,000    5    3    6
## 50  CYP                         Cyprus         659,350    0    1    0
## 51  CZE                 Czech Republic      10,520,000    4    3    3
## 52  COD   Democratic Republic of Congo      65,965,000    0    0    0
## 53  DNK                        Denmark       5,547,000    2    4    3
## 54  DJI                       Djibouti         889,000    0    0    0
## 55  DMA                       Dominica          68,000    0    0    0
## 56  DOM             Dominican Republic       9,927,000    1    1    0
## 57  TLS                     East Timor       1,124,000    0    0    0
## 58  ECU                        Ecuador      14,465,000    0    0    0
## 59  EGY                          Egypt      81,121,000    0    2    0
## 60  SLV                    El Salvador       6,193,000    0    0    0
## 61  GNQ              Equatorial Guinea         700,000    0    0    0
## 62  ERI                        Eritrea       5,254,000    0    0    0
## 63  EST                        Estonia       1,340,000    0    1    1
## 64  ETH                       Ethiopia      82,950,000    3    1    3
## 65  FJI                           Fiji         860,000    0    0    0
## 66  FIN                        Finland       5,364,000    0    1    2
## 67  FRA                         France      64,895,000   11   11   12
## 68  GAB                          Gabon       1,505,000    0    1    0
## 69  GMB                         Gambia       1,729,000    0    0    0
## 70  GEO                        Georgia       4,452,000    1    3    3
## 71  DEU                        Germany      81,777,000   11   19   14
## 72  GHA                          Ghana      24,392,000    0    0    0
## 73  GRC                         Greece      11,316,000    0    0    2
## 74  GRD                        Grenada         104,000    1    0    0
## 75  GUM                           Guam         179,000    0    0    0
## 76  GTM                      Guatemala      14,389,000    0    1    0
## 77  GIN                         Guinea       9,982,000    0    0    0
## 78  GNB                  Guinea-Bissau       1,515,000    0    0    0
## 79  GUY                         Guyana         755,000    0    0    0
## 80  HTI                          Haiti       9,993,000    0    0    0
## 81  HND                       Honduras       7,600,000    0    0    0
## 82  HKG                      Hong Kong       7,068,000    0    0    1
## 83  HUN                        Hungary      10,000,000    8    4    5
## 84  ISL                        Iceland         318,000    0    0    0
## 85  IND                          India   1,224,615,000    0    2    4
## 86  IDN                      Indonesia     239,870,000    0    1    1
## 87  IRN                           Iran      73,973,000    4    5    3
## 88  IRQ                           Iraq      32,031,000    0    0    0
## 89  IRL                        Ireland       4,475,000    1    1    3
## 90  ISR                         Israel       7,624,000    0    0    0
## 91  ITA                          Italy      60,483,000    8    9   11
## 92  CIV                    Ivory Coast      19,738,000    0    0    0
## 93  JAM                        Jamaica       2,702,000    4    4    4
## 94  JPN                          Japan     127,451,000    7   14   17
## 95  JOR                         Jordan       6,047,000    0    0    0
## 96  KAZ                     Kazakhstan      16,323,000    7    1    5
## 97  KEN                          Kenya      40,513,000    2    4    5
## 98  KIR                       Kiribati         100,000    0    0    0
## 99  KWT                         Kuwait       2,736,000    0    0    1
## 100 KGZ                     Kyrgyzstan       5,448,000    0    0    0
## 101 LAO                           Laos       6,201,000    0    0    0
## 102 LVA                         Latvia       2,239,000    1    0    1
## 103 LBN                        Lebanon       4,227,000    0    0    0
## 104 LSO                        Lesotho       2,171,000    0    0    0
## 105 LBR                        Liberia       3,994,000    0    0    0
## 106 LBY                          Libya       6,355,000    0    0    0
## 107 LIE                  Liechtenstein          36,032    0    0    0
## 108 LTU                      Lithuania       3,287,000    2    1    2
## 109 LUX                     Luxembourg         507,000    0    0    0
## 110 MKD                      Macedonia       2,060,000    0    0    0
```

```
## 111 MDG                      Madagascar  20,714,000   0    0    0
## 112 MWI                          Malawi  14,901,000   0    0    0
## 113 MYS                        Malaysia  28,401,000   0    1    1
## 114 MDV                        Maldives     316,000   0    0    0
## 115 MLI                            Mali  15,370,000   0    0    0
## 116 MLT                           Malta     416,000   0    0    0
## 117 MHL                 Marshall Islands      54,038   0    0    0
## 118 MRT                      Mauritania   3,460,000   0    0    0
## 119 MUS                       Mauritius   1,281,000   0    0    0
## 120 MEX                          Mexico 113,423,000   1    3    3
## 121 FSM                      Micronesia     111,000   0    0    0
## 122 MDA                         Moldova   3,562,000   0    0    2
## 123 MCO                          Monaco      35,407   0    0    0
## 124 MNG                        Mongolia   2,756,000   0    2    3
## 125 MNE                      Montenegro     632,000   0    1    0
## 126 MAR                         Morocco  31,951,000   0    0    1
## 127 MOZ                      Mozambique  23,390,000   0    0    0
## 128 NAM                         Namibia   2,283,000   0    0    0
## 129 NRU                           Nauru      10,372   0    0    0
## 130 NPL                           Nepal  29,959,000   0    0    0
## 131 NLD                     Netherlands  16,616,000   6    6    8
## 132 NZL                     New Zealand   4,368,000   6    2    5
## 133 NIC                       Nicaragua   5,789,000   0    0    0
## 134 NER                           Niger  15,512,000   0    0    0
## 135 NGA                         Nigeria 158,423,000   0    0    0
## 136 PRK                     North Korea  24,589,122   4    0    2
## 137 NOR                          Norway   4,889,000   2    1    1
## 138 OMN                            Oman   2,783,000   0    0    0
## 139 PAK                        Pakistan 173,593,000   0    0    0
## 140 PLW                           Palau      20,472   0    0    0
## 141 PSE                       Palestine   4,152,000   0    0    0
## 142 PAN                          Panama   3,517,000   0    0    0
## 143 PNG                Papua New Guinea   6,858,000   0    0    0
## 144 PRY                        Paraguay   6,454,000   0    0    0
## 145 PER                            Peru  29,076,000   0    0    0
## 146 PHL                     Philippines  93,261,000   0    0    0
## 147 POL                          Poland  38,184,000   2    2    6
## 148 PRT                        Portugal  10,638,000   0    1    0
## 149 PRI                     Puerto Rico   3,978,000   0    1    1
## 150 QAT                           Qatar   1,759,000   0    0    2
## 151 ROU                         Romania  21,438,000   2    5    2
## 152 RUS                          Russia 141,750,000  24   26   32
## 153 RWA                          Rwanda  10,624,000   0    0    0
## 154 KNA            Saint Kitts and Nevis      52,000   0    0    0
## 155 LCA                     Saint Lucia     174,000   0    0    0
## 156 VCT Saint Vincent and the Grenadines     109,000   0    0    0
## 157 WSM                           Samoa     184,000   0    0    0
## 158 SMR                      San Marino      31,534   0    0    0
## 159 STP           Sao Tome and Principe     165,000   0    0    0
## 160 SAU                    Saudi Arabia  27,448,000   0    0    1
## 161 SEN                         Senegal  12,434,000   0    0    0
## 162 SRB                          Serbia   7,291,000   1    1    2
## 163 SYC                      Seychelles      87,000   0    0    0
## 164 SLE                    Sierra Leone   5,867,000   0    0    0
## 165 SGP                       Singapore   5,077,000   0    0    2
## 166 SVK                        Slovakia   5,430,000   0    1    3
## 167 SVN                        Slovenia   2,049,000   1    1    2
## 168 SLB                 Solomon Islands     538,000   0    0    0
## 169 SOM                         Somalia   9,331,000   0    0    0
## 170 ZAF                    South Africa  49,991,000   3    2    1
## 171 KOR                     South Korea  48,875,000  13    8    7
## 172 ESP                           Spain  46,071,000   3   10    4
## 173 LKA                       Sri Lanka  20,860,000   0    0    0
## 174 SDN                           Sudan  43,552,000   0    0    0
## 175 SUR                         Surinam     525,000   0    0    0
## 176 SWZ                       Swaziland   1,056,000   0    0    0
## 177 SWE                          Sweden   9,378,000   1    4    3
## 178 CHE                     Switzerland   7,826,000   2    2    0
## 179 SYR                           Syria  20,447,000   0    0    0
## 180 TWN                          Taiwan  23,174,528   0    1    1
## 181 TJK                      Tajikistan   6,879,000   0    0    1
## 182 TZA                        Tanzania  44,841,000   0    0    0
## 183 THA                        Thailand  69,122,000   0    2    1
```

```
## 183 THA            Thailand    69,122,000    0    2    1
## 184 TGO                Togo     6,028,000    0    0    0
## 185 TON               Tonga       104,000    0    0    0
## 186 TTO Trinidad and Tobago     1,341,000    1    0    3
## 187 TUN             Tunisia    10,549,000    1    1    1
## 188 TUR              Turkey    72,752,000    2    2    1
## 189 TKM        Turkmenistan     5,042,000    0    0    0
## 190 TUV              Tuvalu         9,827    0    0    0
## 191 UGA              Uganda    33,424,000    1    0    0
## 192 GBR                  UK    62,232,000   29   17   19
## 193 UKR             Ukraine    45,871,000    6    5    9
## 194 ARE United Arab Emirates    7,512,000    0    0    0
## 195 URY             Uruguay     3,357,000    0    0    0
## 196 USA                  US   309,349,000   46   29   29
## 197 UZB          Uzbekistan    28,228,000    1    0    3
## 198 VUT             Vanuatu       240,000    0    0    0
## 199 VEN           Venezuela    28,834,000    1    0    0
## 200 VNM             Vietnam    86,928,000    0    0    0
## 201 VIR       Virgin Islands      110,000    0    0    0
## 202 YEM               Yemen    24,053,000    0    0    0
## 203 ZMB              Zambia    12,927,000    0    0    0
## 204 ZWE            Zimbabwe    12,571,000    0    0    0
```

```
nomedals <- subset(olympic2012, Gold == 0 & olympic2012$Silver == 0 & olympic2012$Bronze ==
    0, selec = c(ISO, Country.name))
nomedals
```

```
##     ISO                  Country.name
## 2   ALB                       Albania
## 4   ASM                American Samoa
## 5   AND                       Andorra
## 6   AGO                        Angola
## 7   ATG           Antigua and Barbuda
## 10  ABW                         Aruba
## 12  AUT                       Austria
## 16  BGD                    Bangladesh
## 17  BRB                      Barbados
## 20  BLZ                        Belize
## 21  BEN                         Benin
## 22  BMU                       Bermuda
## 23  BTN                        Bhutan
## 24  BOL                       Bolivia
## 25  BIH        Bosnia and Herzegovina
## 28  VGB        British Virgin Islands
## 29  BRN                        Brunei
## 31  BFA                  Burkina Faso
## 32  MMR                         Burma
## 33  BDI                       Burundi
## 34  KHM                      Cambodia
## 35  CMR                      Cameroon
## 37  CPV                    Cape Verde
## 38  CYM                Cayman Islands
## 39  CAF      Central African Republic
## 40  TCD                          Chad
## 41  CHL                         Chile
## 44  COM                       Comoros
## 45  COG             Congo-Brazzaville
## 46  COK                  Cook Islands
## 47  CRI                    Costa Rica
## 52  COD  Democratic Republic of Congo
## 54  DJI                      Djibouti
## 55  DMA                      Dominica
## 57  TLS                    East Timor
## 58  ECU                       Ecuador
## 60  SLV                   El Salvador
## 61  GNQ             Equatorial Guinea
## 62  ERI                       Eritrea
## 65  FJI                          Fiji
## 69  GMB                        Gambia
## 72  GHA                         Ghana
## 75  GUM                          Guam
## 77  GIN                        Guinea
```

```
## 78  GNB                    Guinea-Bissau
## 79  GUY                          Guyana
## 80  HTI                           Haiti
## 81  HND                        Honduras
## 84  ISL                         Iceland
## 88  IRQ                            Iraq
## 90  ISR                          Israel
## 92  CIV                     Ivory Coast
## 95  JOR                          Jordan
## 98  KIR                        Kiribati
## 100 KGZ                      Kyrgyzstan
## 101 LAO                            Laos
## 103 LBN                         Lebanon
## 104 LSO                         Lesotho
## 105 LBR                         Liberia
## 106 LBY                           Libya
## 107 LIE                   Liechtenstein
## 109 LUX                      Luxembourg
## 110 MKD                       Macedonia
## 111 MDG                      Madagascar
## 112 MWI                          Malawi
## 114 MDV                        Maldives
## 115 MLI                            Mali
## 116 MLT                           Malta
## 117 MHL                 Marshall Islands
## 118 MRT                      Mauritania
## 119 MUS                       Mauritius
## 121 FSM                      Micronesia
## 123 MCO                          Monaco
## 127 MOZ                      Mozambique
## 128 NAM                         Namibia
## 129 NRU                           Nauru
## 130 NPL                           Nepal
## 133 NIC                       Nicaragua
## 134 NER                           Niger
## 135 NGA                         Nigeria
## 138 OMN                            Oman
## 139 PAK                        Pakistan
## 140 PLW                           Palau
## 141 PSE                       Palestine
## 142 PAN                          Panama
## 143 PNG                Papua New Guinea
## 144 PRY                        Paraguay
## 145 PER                            Peru
## 146 PHL                     Philippines
## 153 RWA                          Rwanda
## 154 KNA           Saint Kitts and Nevis
## 155 LCA                     Saint Lucia
## 156 VCT Saint Vincent and the Grenadines
## 157 WSM                           Samoa
## 158 SMR                      San Marino
## 159 STP           Sao Tome and Principe
## 161 SEN                         Senegal
## 163 SYC                      Seychelles
## 164 SLE                    Sierra Leone
## 168 SLB                 Solomon Islands
## 169 SOM                         Somalia
## 173 LKA                       Sri Lanka
## 174 SDN                           Sudan
## 175 SUR                         Surinam
## 176 SWZ                       Swaziland
## 179 SYR                           Syria
## 182 TZA                        Tanzania
## 184 TGO                            Togo
## 185 TON                           Tonga
## 189 TKM                    Turkmenistan
## 190 TUV                          Tuvalu
## 194 ARE            United Arab Emirates
## 195 URY                         Uruguay
## 198 VUT                         Vanuatu
## 200 VNM                         Vietnam
## 201 VIR                   Virgin Islands
## 202 YEM                           Yemen
```

```
## 202 YEM                        Yemen
## 203 ZMB                        Zambia
## 204 ZWE                        Zimbabwe
```

```
nrow(nomedals)/nrow(olympic2012)
```

```
## [1] 0.5833333
```