Assignment1

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Loading the CSV

```
data= read.csv("EurostatCrime2015.csv", header = TRUE)

data
```

```
##                                                                      X
## 1                                                               Albania
## 2                                                               Austria
## 3                                                               Belgium
## 4                                                 Bosnia and Herzegovina
## 5                                                              Bulgaria
## 6                                                               Croatia
## 7                                                                Cyprus
## 8                                                        Czech Republic
## 9                                                               Denmark
## 10                                                     England and Wales
## 11                                                               Estonia
## 12                                                               Finland
## 13                          Former Yugoslav Republic of Macedonia, the
## 14                                                                France
## 15                                                               Germany
## 16                                                                Greece
## 17                                                               Hungary
## 18                                                               Iceland
## 19                                                               Ireland
## 20                                                                 Italy
## 21 Kosovo (under United Nations Security Council Resolution 1244/99)
## 22                                                                Latvia
## 23                                                         Liechtenstein
## 24                                                             Lithuania
## 25                                                            Luxembourg
## 26                                                                 Malta
## 27                                                            Montenegro
## 28                                                           Netherlands
## 29                                                   Northern Ireland (UK)
## 30                                                                Norway
## 31                                                                Poland
## 32                                                              Portugal
## 33                                                               Romania
## 34                                                              Scotland
## 35                                                                Serbia
## 36                                                              Slovakia
## 37                                                              Slovenia
## 38                                                                 Spain
## 39                                                                Sweden
## 40                                                           Switzerland
```

```
## 41                                                                Turkey
##    Assault Intentional.homicide  Rape Robbery Sexual.assault
## 1       NA                   NA    NA      NA             NA
## 2    40.36                 0.49 13.18   39.83          27.39
## 3   603.26                 1.96 25.50  196.68          65.92
## 4       NA                   NA    NA      NA             NA
## 5    34.99                 1.79  1.65   27.02           6.72
## 6    19.03                 0.88  6.11   31.03           8.21
## 7    16.65                 1.42  2.36   10.98           9.45
## 8   148.69                 0.80  5.67   19.19           7.79
## 9    25.80                 0.81 18.57   35.94          19.88
## 10  744.32                   NA 62.07   88.27             NA
## 11    7.45                 3.19 12.24   25.63           9.35
## 12   28.22                 1.61 19.23   28.33          31.74
## 13      NA                   NA    NA      NA             NA
## 14  367.19                 1.53 19.49  157.79          30.06
## 15  156.90                 0.81  8.65   55.01          33.55
## 16   14.96                 0.79  1.12   39.75           3.52
## 17  127.80                 1.00  3.84   14.64           2.45
## 18   25.83                 0.91 54.09   16.10             NA
## 19  321.48                 1.32 11.62   55.63          34.74
## 20  105.34                 0.77    NA   57.68           6.58
## 21      NA                   NA    NA      NA             NA
## 22   26.89                 4.08  3.02   39.22          10.62
## 23  329.18                 0.00  2.68    8.03          42.82
## 24    7.33                 5.75  5.31   54.43           7.46
## 25  108.00                 0.89 12.08   98.41          51.16
## 26   42.62                 0.93  5.36   56.37          18.87
## 27   22.50                 2.73  0.80   25.08           3.38
## 28  282.21                   NA  7.07   56.89          36.45
## 29   65.29                 1.25 38.66   43.85         116.89
## 30      NA                   NA    NA      NA             NA
## 31   14.52                 0.75  3.24   21.42           1.40
## 32    4.52                 0.96  3.61  149.13          21.24
## 33    1.50                 1.46  5.11   16.90           3.24
## 34      NA                   NA    NA      NA         145.04
## 35   16.05                 1.28  0.86   42.59           3.91
## 36   35.05                 0.89  1.60    9.94          10.29
## 37   74.65                 0.97  2.04   11.25          10.47
## 38   62.55                 0.65  2.65  139.03          18.60
## 39   47.52                 1.15 56.88   86.80         120.79
## 40    7.48                 0.69  6.46   39.80          26.44
## 41      NA                   NA    NA      NA             NA
##    Sexual.violence   Theft
## 1               NA      NA
## 2            40.57 1586.92
## 3            91.42 1660.42
## 4               NA      NA
## 5             8.37  531.99
## 6            14.32  320.62
## 7            11.81  108.38
## 8            13.47 1319.87
## 9            38.45 3436.13
## 10              NA 2215.82
```

2

```
## 11             21.60  863.51
## 12             50.97 1781.22
## 13                NA      NA
## 14             49.54 1846.91
## 15             42.20 1646.84
## 16              4.64  923.72
## 17              6.28 1031.67
## 18                NA 1225.16
## 19             46.36 1500.60
## 20                NA 1719.49
## 21                NA      NA
## 22             13.64  976.14
## 23             45.50  516.51
## 24             12.77  688.78
## 25             63.24 1650.74
## 26             24.22 2015.40
## 27              4.18  132.94
## 28             43.52 3219.39
## 29            155.54 1300.20
## 30                NA      NA
## 31              4.64  363.54
## 32             24.86  832.95
## 33              8.35  545.72
## 34                NA      NA
## 35              4.76  317.71
## 36             11.90  444.37
## 37             12.51 1105.16
## 38             21.25  442.96
## 39            177.67 3828.01
## 40             32.90 1772.66
## 41                NA      NA
```

Size and structure of the data frame

```
typeof(data)
```

```
## [1] "list"
```

```
nrow(data)
```

```
## [1] 41
```

```
ncol(data)
```

```
## [1] 8
```

Add a new column called Sex.crime which contains the sum of all the crimes that have a sexual component: Rape, Sexual.assault and Sexual.violence

```
data$"Sexual.Crime"  <- rowSums(cbind(data$"Sexual.assault", data$"Sexual.violence", data$"Rape"), na.rm
data
```

```
##                                                                 X
## 1                                                           Albania
## 2                                                           Austria
## 3                                                           Belgium
## 4                                           Bosnia and Herzegovina
## 5                                                          Bulgaria
## 6                                                           Croatia
## 7                                                            Cyprus
## 8                                                    Czech Republic
## 9                                                           Denmark
## 10                                                England and Wales
## 11                                                          Estonia
## 12                                                          Finland
## 13                      Former Yugoslav Republic of Macedonia, the
## 14                                                           France
## 15                                                          Germany
## 16                                                           Greece
## 17                                                          Hungary
## 18                                                          Iceland
## 19                                                          Ireland
## 20                                                            Italy
## 21 Kosovo (under United Nations Security Council Resolution 1244/99)
## 22                                                           Latvia
## 23                                                    Liechtenstein
## 24                                                        Lithuania
## 25                                                       Luxembourg
## 26                                                            Malta
## 27                                                       Montenegro
## 28                                                      Netherlands
## 29                                             Northern Ireland (UK)
## 30                                                           Norway
## 31                                                           Poland
## 32                                                         Portugal
## 33                                                          Romania
## 34                                                         Scotland
## 35                                                           Serbia
## 36                                                         Slovakia
## 37                                                         Slovenia
## 38                                                            Spain
## 39                                                           Sweden
## 40                                                      Switzerland
## 41                                                           Turkey
##    Assault Intentional.homicide  Rape Robbery Sexual.assault
## 1       NA                   NA    NA      NA             NA
## 2    40.36                 0.49 13.18   39.83          27.39
```

4

```
## 3    603.26                 1.96 25.50  196.68         65.92
## 4       NA                   NA    NA      NA             NA
## 5     34.99                 1.79  1.65   27.02          6.72
## 6     19.03                 0.88  6.11   31.03          8.21
## 7     16.65                 1.42  2.36   10.98          9.45
## 8    148.69                 0.80  5.67   19.19          7.79
## 9     25.80                 0.81 18.57   35.94         19.88
## 10   744.32                   NA 62.07   88.27            NA
## 11    7.45                  3.19 12.24   25.63          9.35
## 12   28.22                  1.61 19.23   28.33         31.74
## 13      NA                   NA    NA      NA             NA
## 14   367.19                 1.53 19.49  157.79         30.06
## 15   156.90                 0.81  8.65   55.01         33.55
## 16    14.96                 0.79  1.12   39.75          3.52
## 17   127.80                 1.00  3.84   14.64          2.45
## 18    25.83                 0.91 54.09   16.10            NA
## 19   321.48                 1.32 11.62   55.63         34.74
## 20   105.34                 0.77    NA   57.68          6.58
## 21      NA                   NA    NA      NA             NA
## 22    26.89                 4.08  3.02   39.22         10.62
## 23   329.18                 0.00  2.68    8.03         42.82
## 24    7.33                  5.75  5.31   54.43          7.46
## 25   108.00                 0.89 12.08   98.41         51.16
## 26    42.62                 0.93  5.36   56.37         18.87
## 27    22.50                 2.73  0.80   25.08          3.38
## 28   282.21                   NA  7.07   56.89         36.45
## 29    65.29                 1.25 38.66   43.85        116.89
## 30      NA                   NA    NA      NA             NA
## 31    14.52                 0.75  3.24   21.42          1.40
## 32    4.52                  0.96  3.61  149.13         21.24
## 33    1.50                  1.46  5.11   16.90          3.24
## 34      NA                   NA    NA      NA         145.04
## 35    16.05                 1.28  0.86   42.59          3.91
## 36    35.05                 0.89  1.60    9.94         10.29
## 37    74.65                 0.97  2.04   11.25         10.47
## 38    62.55                 0.65  2.65  139.03         18.60
## 39    47.52                 1.15 56.88   86.80        120.79
## 40    7.48                  0.69  6.46   39.80         26.44
## 41      NA                   NA    NA      NA             NA
##    Sexual.violence   Theft Sexual.Crime
## 1              NA      NA          0.00
## 2           40.57 1586.92         81.14
## 3           91.42 1660.42        182.84
## 4              NA      NA          0.00
## 5            8.37  531.99         16.74
## 6           14.32  320.62         28.64
## 7           11.81  108.38         23.62
## 8           13.47 1319.87         26.93
## 9           38.45 3436.13         76.90
## 10             NA 2215.82         62.07
## 11          21.60  863.51         43.19
## 12          50.97 1781.22        101.94
## 13             NA      NA          0.00
## 14          49.54 1846.91         99.09
```

```
## 15              42.20 1646.84       84.40
## 16               4.64  923.72        9.28
## 17               6.28 1031.67       12.57
## 18                 NA 1225.16       54.09
## 19              46.36 1500.60       92.72
## 20                 NA 1719.49        6.58
## 21                 NA      NA        0.00
## 22              13.64  976.14       27.28
## 23              45.50  516.51       91.00
## 24              12.77  688.78       25.54
## 25              63.24 1650.74      126.48
## 26              24.22 2015.40       48.45
## 27               4.18  132.94        8.36
## 28              43.52 3219.39       87.04
## 29             155.54 1300.20      311.09
## 30                 NA      NA        0.00
## 31               4.64  363.54        9.28
## 32              24.86  832.95       49.71
## 33               8.35  545.72       16.70
## 34                 NA      NA      145.04
## 35               4.76  317.71        9.53
## 36              11.90  444.37       23.79
## 37              12.51 1105.16       25.02
## 38              21.25  442.96       42.50
## 39             177.67 3828.01      355.34
## 40              32.90 1772.66       65.80
## 41                 NA      NA        0.00
```

```r
data = data[,!(names(data) %in% c("Rape","Sexual.violence", "Sexual.assault"))]
data
```

```
##                                                                      X
## 1                                                              Albania
## 2                                                              Austria
## 3                                                              Belgium
## 4                                               Bosnia and Herzegovina
## 5                                                             Bulgaria
## 6                                                              Croatia
## 7                                                               Cyprus
## 8                                                       Czech Republic
## 9                                                              Denmark
## 10                                                   England and Wales
## 11                                                             Estonia
## 12                                                             Finland
## 13                   Former Yugoslav Republic of Macedonia, the
## 14                                                              France
## 15                                                             Germany
## 16                                                              Greece
## 17                                                             Hungary
## 18                                                             Iceland
## 19                                                             Ireland
## 20                                                               Italy
## 21 Kosovo (under United Nations Security Council Resolution 1244/99)
## 22                                                              Latvia
```

```
## 23                                                          Liechtenstein
## 24                                                             Lithuania
## 25                                                            Luxembourg
## 26                                                                 Malta
## 27                                                            Montenegro
## 28                                                           Netherlands
## 29                                                  Northern Ireland (UK)
## 30                                                                Norway
## 31                                                                Poland
## 32                                                              Portugal
## 33                                                               Romania
## 34                                                              Scotland
## 35                                                                Serbia
## 36                                                              Slovakia
## 37                                                              Slovenia
## 38                                                                 Spain
## 39                                                                Sweden
## 40                                                           Switzerland
## 41                                                                Turkey
##    Assault Intentional.homicide Robbery   Theft Sexual.Crime
## 1       NA                   NA      NA      NA         0.00
## 2    40.36                 0.49   39.83 1586.92        81.14
## 3   603.26                 1.96  196.68 1660.42       182.84
## 4       NA                   NA      NA      NA         0.00
## 5    34.99                 1.79   27.02  531.99        16.74
## 6    19.03                 0.88   31.03  320.62        28.64
## 7    16.65                 1.42   10.98  108.38        23.62
## 8   148.69                 0.80   19.19 1319.87        26.93
## 9    25.80                 0.81   35.94 3436.13        76.90
## 10  744.32                   NA   88.27 2215.82        62.07
## 11    7.45                 3.19   25.63  863.51        43.19
## 12   28.22                 1.61   28.33 1781.22       101.94
## 13      NA                   NA      NA      NA         0.00
## 14  367.19                 1.53  157.79 1846.91        99.09
## 15  156.90                 0.81   55.01 1646.84        84.40
## 16   14.96                 0.79   39.75  923.72         9.28
## 17  127.80                 1.00   14.64 1031.67        12.57
## 18   25.83                 0.91   16.10 1225.16        54.09
## 19  321.48                 1.32   55.63 1500.60        92.72
## 20  105.34                 0.77   57.68 1719.49         6.58
## 21      NA                   NA      NA      NA         0.00
## 22   26.89                 4.08   39.22  976.14        27.28
## 23  329.18                 0.00    8.03  516.51        91.00
## 24    7.33                 5.75   54.43  688.78        25.54
## 25  108.00                 0.89   98.41 1650.74       126.48
## 26   42.62                 0.93   56.37 2015.40        48.45
## 27   22.50                 2.73   25.08  132.94         8.36
## 28  282.21                   NA   56.89 3219.39        87.04
## 29   65.29                 1.25   43.85 1300.20       311.09
## 30      NA                   NA      NA      NA         0.00
## 31   14.52                 0.75   21.42  363.54         9.28
## 32    4.52                 0.96  149.13  832.95        49.71
## 33    1.50                 1.46   16.90  545.72        16.70
## 34      NA                   NA      NA      NA       145.04
```

7

```
## 35    16.05                1.28    42.59  317.71          9.53
## 36    35.05                0.89     9.94  444.37         23.79
## 37    74.65                0.97    11.25 1105.16         25.02
## 38    62.55                0.65   139.03  442.96         42.50
## 39    47.52                1.15    86.80 3828.01        355.34
## 40     7.48                0.69    39.80 1772.66         65.80
## 41       NA                  NA      NA      NA          0.00
```

```r
typeof(data)
```

```
## [1] "list"
```

```r
nrow(data)
```

```
## [1] 41
```

```r
ncol(data)
```

```
## [1] 6
```

```r
areComplete <- data[!complete.cases(data),]
areComplete[,"X", drop =FALSE]
```

```
##                                                                      X
## 1                                                              Albania
## 4                                               Bosnia and Herzegovina
## 10                                                     England and Wales
## 13                          Former Yugoslav Republic of Macedonia, the
## 21 Kosovo (under United Nations Security Council Resolution 1244/99)
## 28                                                          Netherlands
## 30                                                               Norway
## 34                                                             Scotland
## 41                                                               Turkey
```

```r
mydata = data[complete.cases(data), ]

mydata[,"X", drop =FALSE]
```

```
##                    X
## 2             Austria
## 3             Belgium
## 5            Bulgaria
## 6             Croatia
## 7              Cyprus
## 8      Czech Republic
## 9             Denmark
## 11            Estonia
## 12            Finland
## 14             France
## 15            Germany
```

```
## 16              Greece
## 17             Hungary
## 18             Iceland
## 19             Ireland
## 20               Italy
## 22              Latvia
## 23       Liechtenstein
## 24           Lithuania
## 25          Luxembourg
## 26               Malta
## 27          Montenegro
## 29 Northern Ireland (UK)
## 31              Poland
## 32            Portugal
## 33             Romania
## 35              Serbia
## 36            Slovakia
## 37            Slovenia
## 38               Spain
## 39              Sweden
## 40         Switzerland
```

```r
dim(mydata)
```

```
## [1] 32  6
```

Including Plots

You can also embed plots, for example:

Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.