eda-la1

Author: K Arshitha USN: 1NT20IS068

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R markdown

```
dataset <-read.csv("C:/Users/Dataset/archive/2015.csv")
library(readxl)

library(dplyr)

##
## Attaching package: 'dplyr'

## The following objects are masked from 'package:stats':
##
##     filter, lag

## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union

grouped_data <- dataset %>% group_by(Region) %>% summarise(avg_happiness = me
an(Happiness.Score))
```

to view summary of the dataset

```
head(dataset)

##       Country         Region Happiness.Rank Happiness.Score Standard.Error
## 1 Switzerland Western Europe              1           7.587        0.03411
## 2     Iceland Western Europe              2           7.561        0.04884
## 3     Denmark Western Europe              3           7.527        0.03328
## 4      Norway Western Europe              4           7.522        0.03880
## 5      Canada  North America              5           7.427        0.03553
## 6     Finland Western Europe              6           7.406        0.03140
##   Economy..GDP.per.Capita.  Family Health..Life.Expectancy. Freedom
## 1                  1.39651 1.34951                  0.94143 0.66557
## 2                  1.30232 1.40223                  0.94784 0.62877
## 3                  1.32548 1.36058                  0.87464 0.64938
## 4                  1.45900 1.33095                  0.88521 0.66973
## 5                  1.32629 1.32261                  0.90563 0.63297
## 6                  1.29025 1.31826                  0.88911 0.64169
##   Trust..Government.Corruption. Generosity Dystopia.Residual
## 1                       0.41978    0.29678           2.51738
## 2                       0.14145    0.43630           2.70201
## 3                       0.48357    0.34139           2.49204
## 4                       0.36503    0.34699           2.46531
```

```
## 5                       0.32957    0.45811           2.45176
## 6                       0.41372    0.23351           2.61955
```

row name of dataset

```
rownames(dataset)
```

```
##   [1] "1"   "2"   "3"   "4"   "5"   "6"   "7"   "8"   "9"   "10"  "11"  "12"
##  [13] "13"  "14"  "15"  "16"  "17"  "18"  "19"  "20"  "21"  "22"  "23"  "24"
##  [25] "25"  "26"  "27"  "28"  "29"  "30"  "31"  "32"  "33"  "34"  "35"  "36"
##  [37] "37"  "38"  "39"  "40"  "41"  "42"  "43"  "44"  "45"  "46"  "47"  "48"
##  [49] "49"  "50"  "51"  "52"  "53"  "54"  "55"  "56"  "57"  "58"  "59"  "60"
##  [61] "61"  "62"  "63"  "64"  "65"  "66"  "67"  "68"  "69"  "70"  "71"  "72"
##  [73] "73"  "74"  "75"  "76"  "77"  "78"  "79"  "80"  "81"  "82"  "83"  "84"
##  [85] "85"  "86"  "87"  "88"  "89"  "90"  "91"  "92"  "93"  "94"  "95"  "96"
##  [97] "97"  "98"  "99"  "100" "101" "102" "103" "104" "105" "106" "107" "108"
## [109] "109" "110" "111" "112" "113" "114" "115" "116" "117" "118" "119" "120"
## [121] "121" "122" "123" "124" "125" "126" "127" "128" "129" "130" "131" "132"
## [133] "133" "134" "135" "136" "137" "138" "139" "140" "141" "142" "143" "144"
## [145] "145" "146" "147" "148" "149" "150" "151" "152" "153" "154" "155" "156"
## [157] "157" "158"
```

to view colonames in a dataset

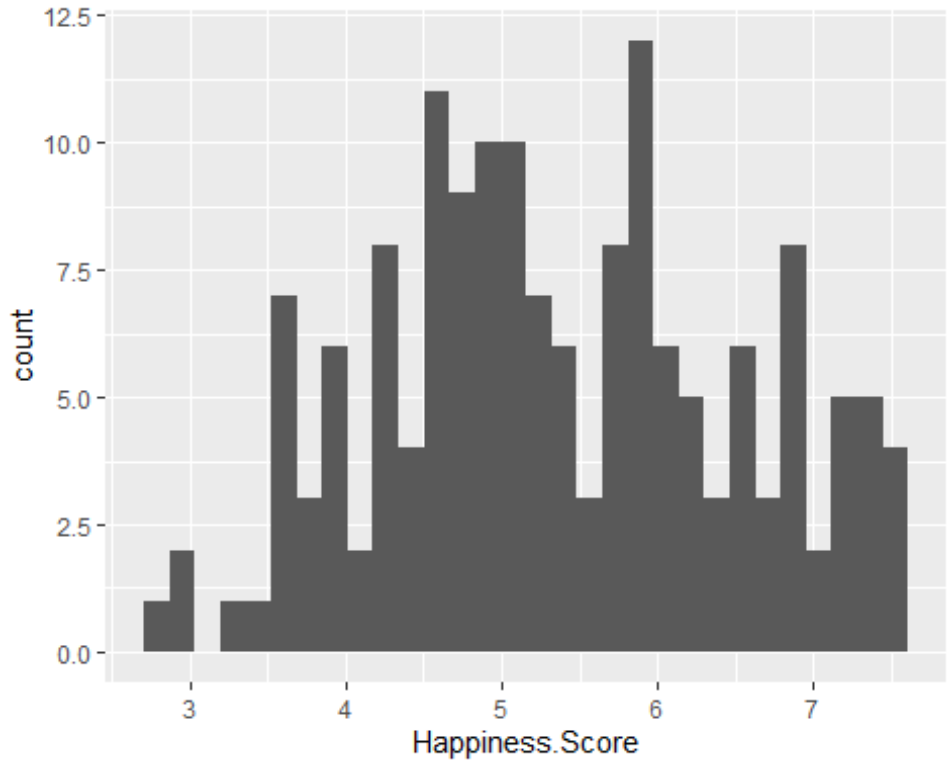
```
colnames(dataset)
```

```
##  [1] "Country"                    "Region"
##  [3] "Happiness.Rank"             "Happiness.Score"
##  [5] "Standard.Error"             "Economy..GDP.per.Capita."
##  [7] "Family"                     "Health..Life.Expectancy."
##  [9] "Freedom"                    "Trust..Government.Corruption."
## [11] "Generosity"                 "Dystopia.Residual"
```

#to plot histogram

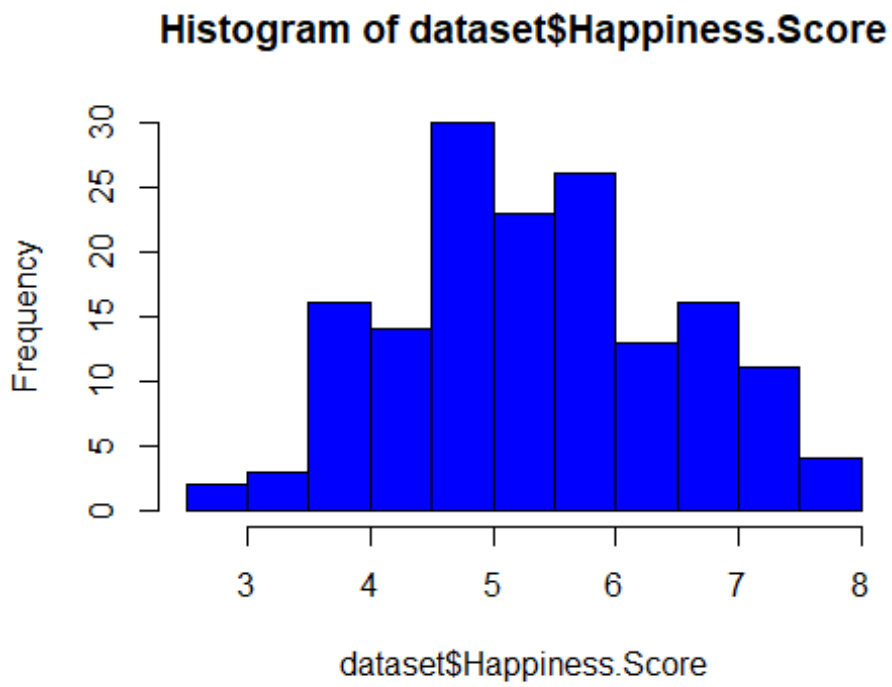
```
library(ggplot2)
ggplot(dataset,aes(x=Happiness.Score))+geom_histogram()
```

```
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```



to plot histogram with a color

```
hist(dataset$Happiness.Score,col="blue")
```



to determine the length of a vector

```
length(vector())
```

```
## [1] 0
```

to find the mean of coloumn

```
mean(dataset$Happiness.Score)
```

```
## [1] 5.375734
```

to find median of coloumn

```
median(dataset$Happiness.Rank)
```

```
## [1] 79.5
```

#By changing the options("max.print") value, you can set the default number of rows to display.

```
options(max.print = 30)
```

#to find the dimensions of the dataset

```
dim(dataset)
```

```
## [1] 158  12
```

to find the number of rows in the dataset

```
nrow(dataset)
```

```
## [1] 158
```

to find number of coloumns in a datset

```
ncol(dataset)
```

```
## [1] 12
```

to show the coloumn names in the dataset

```
names(dataset)
```

```
##  [1] "Country"                          "Region"
##  [3] "Happiness.Rank"                   "Happiness.Score"
##  [5] "Standard.Error"                   "Economy..GDP.per.Capita."
##  [7] "Family"                           "Health..Life.Expectancy."
##  [9] "Freedom"                          "Trust..Government.Corruption."
## [11] "Generosity"                       "Dystopia.Residual"
```

to view the last few rows ofa dataset

```
tail(dataset)
```

```
##         Country             Region Happiness.Rank Happiness.Score
## 153 Afghanistan      Southern Asia            153           3.575
## 154      Rwanda Sub-Saharan Africa            154           3.465
##     Standard.Error Economy..GDP.per.Capita.  Family Health..Life.Expectanc
y.
## 153        0.03084                 0.31982 0.30285                  0.303
35
## 154        0.03464                 0.22208 0.77370                  0.428
64
##     Freedom Trust..Government.Corruption. Generosity Dystopia.Residual
## 153 0.23414                       0.09719    0.36510           1.95210
## 154 0.59201                       0.55191    0.22628           0.67042
##  [ reached 'max' / getOption("max.print") -- omitted 4 rows ]
```

to extract a subset of a datframe based on a condition

```
subset(dataset)
```

```
##       Country         Region Happiness.Rank Happiness.Score Standard.Error
## 1 Switzerland Western Europe              1           7.587        0.03411
## 2     Iceland Western Europe              2           7.561        0.04884
##   Economy..GDP.per.Capita.  Family Health..Life.Expectancy. Freedom
## 1                  1.39651 1.34951                  0.94143 0.66557
```

```
## 2                   1.30232 1.40223                   0.94784 0.62877
##   Trust..Government.Corruption. Generosity Dystopia.Residual
## 1                       0.41978    0.29678           2.51738
## 2                       0.14145    0.43630           2.70201
##  [ reached 'max' / getOption("max.print") -- omitted 156 rows ]
```

to select only specific coloumn from a dataframe

```
library(dplyr)
dataset %>% select(2,3)
```

```
##                             Region Happiness.Rank
## 1                  Western Europe              1
## 2                  Western Europe              2
## 3                  Western Europe              3
## 4                  Western Europe              4
## 5                   North America              5
## 6                  Western Europe              6
## 7                  Western Europe              7
## 8                  Western Europe              8
## 9       Australia and New Zealand              9
## 10      Australia and New Zealand             10
## 11 Middle East and Northern Africa             11
## 12    Latin America and Caribbean             12
## 13                 Western Europe             13
## 14    Latin America and Caribbean             14
## 15                  North America             15
##  [ reached 'max' / getOption("max.print") -- omitted 143 rows ]
```

to Select columns by list of index or position

```
dataset%>% select(c(2,3))
```

```
##                             Region Happiness.Rank
## 1                  Western Europe              1
## 2                  Western Europe              2
## 3                  Western Europe              3
## 4                  Western Europe              4
## 5                   North America              5
## 6                  Western Europe              6
## 7                  Western Europe              7
## 8                  Western Europe              8
## 9       Australia and New Zealand              9
## 10      Australia and New Zealand             10
## 11 Middle East and Northern Africa             11
## 12    Latin America and Caribbean             12
## 13                 Western Europe             13
## 14    Latin America and Caribbean             14
```

```
## 15                   North America             15
##  [ reached 'max' / getOption("max.print") -- omitted 143 rows ]
```

to select coloumn by index range

```
dataset %>% select(2:3)
```

```
##                             Region Happiness.Rank
## 1                  Western Europe              1
## 2                  Western Europe              2
## 3                  Western Europe              3
## 4                  Western Europe              4
## 5                   North America              5
## 6                  Western Europe              6
## 7                  Western Europe              7
## 8                  Western Europe              8
## 9         Australia and New Zealand              9
## 10        Australia and New Zealand             10
## 11 Middle East and Northern Africa             11
## 12     Latin America and Caribbean             12
## 13                 Western Europe             13
## 14     Latin America and Caribbean             14
## 15                  North America             15
##  [ reached 'max' / getOption("max.print") -- omitted 143 rows ]
```

to select coloums by specific name

```
 dataset %>% select(Country,Region)
```

```
##          Country                          Region
## 1    Switzerland                  Western Europe
## 2        Iceland                  Western Europe
## 3        Denmark                  Western Europe
## 4         Norway                  Western Europe
## 5         Canada                   North America
## 6        Finland                  Western Europe
## 7    Netherlands                  Western Europe
## 8         Sweden                  Western Europe
## 9    New Zealand       Australia and New Zealand
## 10     Australia       Australia and New Zealand
## 11        Israel Middle East and Northern Africa
## 12    Costa Rica     Latin America and Caribbean
## 13       Austria                  Western Europe
## 14        Mexico     Latin America and Caribbean
## 15 United States                   North America
##  [ reached 'max' / getOption("max.print") -- omitted 143 rows ]
```

to select coloumns except the mentioned coloumns

```
dataset %>% select(-c('Country','Region'))
```

```
##   Happiness.Rank Happiness.Score Standard.Error Economy..GDP.per.Capita.
## 1              1           7.587        0.03411                   1.39651
## 2              2           7.561        0.04884                   1.30232
## 3              3           7.527        0.03328                   1.32548
##    Family Health..Life.Expectancy. Freedom Trust..Government.Corruption.
## 1 1.34951                 0.94143 0.66557                        0.41978
## 2 1.40223                 0.94784 0.62877                        0.14145
## 3 1.36058                 0.87464 0.64938                        0.48357
##   Generosity Dystopia.Residual
## 1    0.29678           2.51738
## 2    0.43630           2.70201
## 3    0.34139           2.49204
##  [ reached 'max' / getOption("max.print") -- omitted 155 rows ]
```

to Select columns between specfied coloums

```
dataset %>% select('Happiness.Rank':'Family')
```

```
##   Happiness.Rank Happiness.Score Standard.Error Economy..GDP.per.Capita.
## 1              1           7.587        0.03411                   1.39651
## 2              2           7.561        0.04884                   1.30232
## 3              3           7.527        0.03328                   1.32548
## 4              4           7.522        0.03880                   1.45900
## 5              5           7.427        0.03553                   1.32629
## 6              6           7.406        0.03140                   1.29025
##    Family
## 1 1.34951
## 2 1.40223
## 3 1.36058
## 4 1.33095
## 5 1.32261
## 6 1.31826
##  [ reached 'max' / getOption("max.print") -- omitted 152 rows ]
```

to Select columns starts with a string

```
dataset %>% select(starts_with('l'))
```

```
## data frame with 0 columns and 158 rows
```

to Select columns that ends with a string

```
dataset %>% select(starts_with('l'))
```

```
## data frame with 0 columns and 158 rows
```

to Select columns that contains

```
dataset  %>% select(contains('p'))
```

```
##   Happiness.Rank Happiness.Score Economy..GDP.per.Capita.
## 1              1           7.587                  1.39651
## 2              2           7.561                  1.30232
## 3              3           7.527                  1.32548
## 4              4           7.522                  1.45900
## 5              5           7.427                  1.32629
##   Health..Life.Expectancy. Trust..Government.Corruption. Dystopia.Residual
## 1                  0.94143                       0.41978           2.51738
## 2                  0.94784                       0.14145           2.70201
## 3                  0.87464                       0.48357           2.49204
## 4                  0.88521                       0.36503           2.46531
## 5                  0.90563                       0.32957           2.45176
##  [ reached 'max' / getOption("max.print") -- omitted 153 rows ]
```

Select all numeric columns

```
dataset %>% select_if(is.numeric)
```

```
##   Happiness.Rank Happiness.Score Standard.Error Economy..GDP.per.Capita.
## 1              1           7.587        0.03411                  1.39651
## 2              2           7.561        0.04884                  1.30232
## 3              3           7.527        0.03328                  1.32548
##    Family Health..Life.Expectancy. Freedom Trust..Government.Corruption.
## 1 1.34951                  0.94143 0.66557                       0.41978
## 2 1.40223                  0.94784 0.62877                       0.14145
## 3 1.36058                  0.87464 0.64938                       0.48357
##   Generosity Dystopia.Residual
## 1    0.29678           2.51738
## 2    0.43630           2.70201
## 3    0.34139           2.49204
##  [ reached 'max' / getOption("max.print") -- omitted 155 rows ]
```

filter by a row name

```
filter(dataset, Country %in% c("21", "39", "33"))
```

```
##  [1] Country                        Region
##  [3] Happiness.Rank                 Happiness.Score
##  [5] Standard.Error                 Economy..GDP.per.Capita.
##  [7] Family                         Health..Life.Expectancy.
##  [9] Freedom                        Trust..Government.Corruption.
## [11] Generosity                     Dystopia.Residual
## <0 rows> (or 0-length row.names)
```

filter() by row number

```
slice(dataset,5)
```

```
##   Country        Region Happiness.Rank Happiness.Score Standard.Error
## 1  Canada North America              5           7.427        0.03553
##   Economy..GDP.per.Capita.  Family Health..Life.Expectancy. Freedom
## 1                  1.32629 1.32261                  0.90563 0.63297
##   Trust..Government.Corruption. Generosity Dystopia.Residual
## 1                       0.32957    0.45811           2.45176
```

Using arrange in descending order

```
temp <- dataset %>% arrange(desc(Happiness.Rank))
   temp
```

```
##   Country             Region Happiness.Rank Happiness.Score Standard.Error
## 1    Togo Sub-Saharan Africa            158           2.839        0.06727
## 2 Burundi Sub-Saharan Africa            157           2.905        0.08658
##   Economy..GDP.per.Capita.  Family Health..Life.Expectancy. Freedom
## 1                  0.20868 0.13995                  0.28443 0.36453
## 2                  0.01530 0.41587                  0.22396 0.11850
##   Trust..Government.Corruption. Generosity Dystopia.Residual
## 1                       0.10731    0.16681           1.56726
## 2                       0.10062    0.19727           1.83302
##  [ reached 'max' / getOption("max.print") -- omitted 156 rows ]
```

Using arrange by multiple columns

```
 temp <- dataset %>% arrange(Happiness.Rank,desc(Country))
   temp
```

```
##       Country         Region Happiness.Rank Happiness.Score Standard.Error
## 1 Switzerland Western Europe              1           7.587        0.03411
## 2     Iceland Western Europe              2           7.561        0.04884
##   Economy..GDP.per.Capita.  Family Health..Life.Expectancy. Freedom
## 1                  1.39651 1.34951                  0.94143 0.66557
## 2                  1.30232 1.40223                  0.94784 0.62877
##   Trust..Government.Corruption. Generosity Dystopia.Residual
## 1                       0.41978    0.29678           2.51738
## 2                       0.14145    0.43630           2.70201
##  [ reached 'max' / getOption("max.print") -- omitted 156 rows ]
```

Load dplyr

```
library(dplyr)
```

#group_by() on department

```
grp_tbl <- dataset %>% group_by(Country)
grp_tbl
```

```
## # A tibble: 158 × 12
## # Groups:   Country [158]
##    Country     Region             Happiness.Rank Happiness.Score Standard
.Error
##    <chr>       <chr>                       <int>           <dbl>
<dbl>
##  1 Switzerland Western Europe                  1            7.59
0.0341
##  2 Iceland     Western Europe                  2            7.56
0.0488
##  3 Denmark     Western Europe                  3            7.53
0.0333
##  4 Norway      Western Europe                  4            7.52
0.0388
##  5 Canada      North America                   5            7.43
0.0355
##  6 Finland     Western Europe                  6            7.41
0.0314
##  7 Netherlands Western Europe                  7            7.38
0.0280
##  8 Sweden      Western Europe                  8            7.36
0.0316
##  9 New Zealand Australia and New …             9            7.29
0.0337
## 10 Australia   Australia and New …            10            7.28
0.0408
## # ℹ 148 more rows
## # ℹ 7 more variables: Economy..GDP.per.Capita. <dbl>, Family <dbl>,
## #   Health..Life.Expectancy. <dbl>, Freedom <dbl>,
## #   Trust..Government.Corruption. <dbl>, Generosity <dbl>,
## #   Dystopia.Residual <dbl>
```

Convert tibble to DataFrame

```
df2 <- dataset %>% as.data.frame()
  class(df2)
```

```
## [1] "data.frame"
```

#Group by on multiple column

```
 agg_tbl <- dataset %>% group_by(Country) %>%
               summarise(Happiness.Rank=sum(Happiness.Score))
agg_tbl
```

```
## # A tibble: 158 × 2
##    Country     Happiness.Rank
##    <chr>                <dbl>
##  1 Afghanistan           3.58
##  2 Albania               4.96
##  3 Algeria               5.60
##  4 Angola                4.03
```

```
##  5 Argentina             6.57
##  6 Armenia               4.35
##  7 Australia             7.28
##  8 Austria               7.2
##  9 Azerbaijan            5.21
## 10 Bahrain               5.96
## # ℹ 148 more rows
```

is.na(): Checks for missing values in a data frame

```
is.na(dataset)
```

```
##        Country Region Happiness.Rank Happiness.Score Standard.Error
##   [1,]   FALSE  FALSE          FALSE           FALSE          FALSE
##   [2,]   FALSE  FALSE          FALSE           FALSE          FALSE
##        Economy..GDP.per.Capita. Family Health..Life.Expectancy. Freedom
##   [1,]                    FALSE  FALSE                   FALSE   FALSE
##   [2,]                    FALSE  FALSE                   FALSE   FALSE
##        Trust..Government.Corruption. Generosity Dystopia.Residual
##   [1,]                         FALSE      FALSE             FALSE
##   [2,]                         FALSE      FALSE             FALSE
##  [ reached getOption("max.print") -- omitted 156 rows ]
```

complete.cases(): Removes rows with missing values

```
complete.cases(dataset)
```

```
##  [1] TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE
TRUE
## [16] TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE
TRUE
##  [ reached getOption("max.print") -- omitted 128 entries ]
```

mean(): Calculates the mean of a numeric vector

```
 mean(dataset$Happiness.Score)
```

```
## [1] 5.375734
```

median(): Calculates the median of a numeric vector

```
median(dataset$Happiness.Rank)
```

```
## [1] 79.5
```

#sd():Calculates the sd of a numeric data

```
sd(dataset$Economy..GDP.per.Capita.)
```

```
## [1] 0.4031208
```

var(): Calculates the variance of a numeric vector

```
var(dataset$Freedom)
```

```
## [1] 0.02270832
```

max(): Finds the maximum value in a numeric vector

```
max(dataset$Happiness.Rank)
```

```
## [1] 158
```

#min(): finds the minimum value in a numeric vector

```
min(dataset$Happiness.Rank)
```

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

quantile(): Calculates the quantiles of a numeric vector

```
 quantile(dataset$Happiness.Rank)
```

```
##     0%    25%    50%    75%   100%
##   1.00  40.25  79.50 118.75 158.00
```

unique(): Finds the unique values of a vector or column in a data frame

```
  unique(dataset$Counry)
```

```
## NULL
```

duplicated(): Identifies duplicated values in a vector or column in a data frame

```
 duplicated(dataset$Country)
```

```
##  [1] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FAL
SE
## [13] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FAL
SE
## [25] FALSE FALSE FALSE FALSE FALSE FALSE
##  [ reached getOption("max.print") -- omitted 128 entries ]
```

To divide a vector into groups, use the split() function.

```
   split(dataset, f = dataset$Country)
```

```
## $Afghanistan
##         Country        Region Happiness.Rank Happiness.Score Standard.Erro
r
## 153 Afghanistan Southern Asia            153           3.575        0.0308
4
##     Economy..GDP.per.Capita.  Family Health..Life.Expectancy. Freedom
## 153                  0.31982 0.30285                  0.30335 0.23414
```

```
##     Trust..Government.Corruption. Generosity Dystopia.Residual
## 153                       0.09719     0.3651            1.9521
##
## $Albania
##    Country                     Region Happiness.Rank Happiness.Score
## 95 Albania Central and Eastern Europe             95           4.959
##    Standard.Error Economy..GDP.per.Capita.  Family Health..Life.Expectancy
.
## 95        0.05013                  0.87867 0.80434                  0.8132
5
##    Freedom Trust..Government.Corruption. Generosity Dystopia.Residual
## 95 0.35733                       0.06413    0.14272           1.89894
##
## $Algeria
##    Country                          Region Happiness.Rank Happiness.Score
## 68 Algeria Middle East and Northern Africa             68           5.605
##    Standard.Error Economy..GDP.per.Capita.  Family Health..Life.Expectancy
.
## 68        0.05099                  0.93929 1.07772                  0.6176
6
##    Freedom Trust..Government.Corruption. Generosity Dystopia.Residual
## 68 0.28579                       0.17383    0.07822           2.43209
##
## $Angola
##     Country             Region Happiness.Rank Happiness.Score Standard.Err
or
## 137  Angola Sub-Saharan Africa            137           4.033        0.047
58
##     Economy..GDP.per.Capita. Family Health..Life.Expectancy. Freedom
## 137                  0.75778 0.8604                  0.16683 0.10384
##     Trust..Government.Corruption. Generosity Dystopia.Residual
## 137                       0.07122    0.12344           1.94939
##
## $Argentina
##      Country                      Region Happiness.Rank Happiness.Score
## 30 Argentina Latin America and Caribbean             30           6.574
##    Standard.Error Economy..GDP.per.Capita.  Family Health..Life.Expectancy
.
## 30        0.04612                  1.05351 1.24823                  0.7872
3
##    Freedom Trust..Government.Corruption. Generosity Dystopia.Residual
## 30 0.44974                       0.08484    0.11451             2.836
##
## $Armenia
##     Country                     Region Happiness.Rank Happiness.Score
## 127 Armenia Central and Eastern Europe            127            4.35
##     Standard.Error Economy..GDP.per.Capita.  Family Health..Life.Expectanc
y.
## 127        0.04763                  0.76821 0.77711                   0.72
99
```

```
##     Freedom Trust..Government.Corruption. Generosity Dystopia.Residual
## 127 0.19847                         0.039    0.07855           1.75873
##
## $Australia
##      Country                    Region Happiness.Rank Happiness.Score
## 10 Australia Australia and New Zealand             10           7.284
##    Standard.Error Economy..GDP.per.Capita.  Family Health..Life.Expectancy
.
## 10        0.04083                  1.33358 1.30923                  0.9315
6
##    Freedom Trust..Government.Corruption. Generosity Dystopia.Residual
## 10 0.65124                       0.35637    0.43562           2.26646
##
## $Austria
##    Country         Region Happiness.Rank Happiness.Score Standard.Error
## 13 Austria Western Europe             13             7.2        0.03751
##    Economy..GDP.per.Capita.  Family Health..Life.Expectancy. Freedom
## 13                  1.33723 1.29704                  0.89042 0.62433
##    Trust..Government.Corruption. Generosity Dystopia.Residual
## 13                       0.18676    0.33088            2.5332
##
## $Azerbaijan
##       Country                     Region Happiness.Rank Happiness.Score
## 80 Azerbaijan Central and Eastern Europe             80           5.212
##    Standard.Error Economy..GDP.per.Capita.  Family Health..Life.Expectancy
.
## 80        0.03363                  1.02389 0.93793                  0.6404
5
##    Freedom Trust..Government.Corruption. Generosity Dystopia.Residual
## 80  0.3703                       0.16065    0.07799           2.00073
##
## $Bahrain
##    Country                           Region Happiness.Rank Happiness.Score
## 49 Bahrain Middle East and Northern Africa             49            5.96
##    Standard.Error Economy..GDP.per.Capita.  Family Health..Life.Expectancy
.
## 49        0.05412                  1.32376 1.21624                  0.7471
6
##    Freedom Trust..Government.Corruption. Generosity Dystopia.Residual
## 49 0.45492                         0.306    0.17362           1.73797
##
## $Bangladesh
##        Country        Region Happiness.Rank Happiness.Score Standard.Error
## 109 Bangladesh Southern Asia            109           4.694        0.03077
##     Economy..GDP.per.Capita.  Family Health..Life.Expectancy. Freedom
## 109                  0.39753 0.43106                  0.60164  0.4082
##     Trust..Government.Corruption. Generosity Dystopia.Residual
## 109                       0.12569    0.21222           2.51767
##
## $Belarus
```

```
##    Country                      Region Happiness.Rank Happiness.Score
## 59 Belarus Central and Eastern Europe             59           5.813
##    Standard.Error Economy..GDP.per.Capita.  Family Health..Life.Expectancy
.
## 59        0.03938                  1.03192 1.23289                  0.7360
8
##    Freedom Trust..Government.Corruption. Generosity Dystopia.Residual
## 59 0.37938                        0.1909    0.11046            2.1309
##
## $Belgium
##    Country         Region Happiness.Rank Happiness.Score Standard.Error
## 19 Belgium Western Europe             19           6.937        0.03595
##    Economy..GDP.per.Capita.  Family Health..Life.Expectancy. Freedom
## 19                  1.30782 1.28566                  0.89667  0.5845
##    Trust..Government.Corruption. Generosity Dystopia.Residual
## 19                        0.2254     0.2225           2.41484
##
## $Benin
##     Country             Region Happiness.Rank Happiness.Score Standard.Err
or
## 155   Benin Sub-Saharan Africa            155            3.34        0.036
56
##     Economy..GDP.per.Capita.  Family Health..Life.Expectancy. Freedom
## 155                  0.28665 0.35386                   0.3191  0.4845
##     Trust..Government.Corruption. Generosity Dystopia.Residual
## 155                        0.0801     0.1826           1.63328
##
## $Bhutan
##    Country        Region Happiness.Rank Happiness.Score Standard.Error
## 79  Bhutan Southern Asia             79           5.253        0.03225
##    Economy..GDP.per.Capita.  Family Health..Life.Expectancy. Freedom
## 79                  0.77042 1.10395                  0.57407 0.53206
##    Trust..Government.Corruption. Generosity Dystopia.Residual
## 79                       0.15445    0.47998           1.63794
##
## $Bolivia
##    Country                       Region Happiness.Rank Happiness.Score
## 51 Bolivia Latin America and Caribbean             51            5.89
##    Standard.Error Economy..GDP.per.Capita.  Family Health..Life.Expectancy
.
## 51        0.05642                  0.68133 0.97841                   0.539
2
##    Freedom Trust..Government.Corruption. Generosity Dystopia.Residual
## 51 0.57414                         0.088    0.20536           2.82334
##
## $`Bosnia and Herzegovina`
##                   Country                      Region Happiness.Rank
## 96 Bosnia and Herzegovina Central and Eastern Europe             96
##    Happiness.Score Standard.Error Economy..GDP.per.Capita.  Family
## 96           4.949        0.06913                  0.83223 0.91916
```

```
##    Health..Life.Expectancy. Freedom Trust..Government.Corruption. Generosi
ty
## 96                  0.79081 0.09245                       0.00227    0.248
08
##    Dystopia.Residual
## 96           2.06367
##
## $Botswana
##      Country             Region Happiness.Rank Happiness.Score Standard.Er
ror
## 128 Botswana Sub-Saharan Africa            128           4.332        0.04
934
##     Economy..GDP.per.Capita.  Family Health..Life.Expectancy. Freedom
## 128                  0.99355 1.10464                  0.04776 0.49495
##     Trust..Government.Corruption. Generosity Dystopia.Residual
## 128                       0.12474    0.10461           1.46181
##
## $Brazil
##    Country                       Region Happiness.Rank Happiness.Score
## 16  Brazil Latin America and Caribbean             16           6.983
##    Standard.Error Economy..GDP.per.Capita.  Family Health..Life.Expectancy
.
## 16        0.04076                  0.98124 1.23287                  0.6970
2
##    Freedom Trust..Government.Corruption. Generosity Dystopia.Residual
## 16 0.49049                       0.17521    0.14574           3.26001
##
## $Bulgaria
##      Country                       Region Happiness.Rank Happiness.Score
## 134 Bulgaria Central and Eastern Europe            134           4.218
##     Standard.Error Economy..GDP.per.Capita.  Family Health..Life.Expectanc
y.
## 134        0.04828                  1.01216 1.10614                   0.766
49
##     Freedom Trust..Government.Corruption. Generosity Dystopia.Residual
## 134 0.30587                       0.00872    0.11921           0.89991
##
## $`Burkina Faso`
##          Country             Region Happiness.Rank Happiness.Score
## 152 Burkina Faso Sub-Saharan Africa            152           3.587
##     Standard.Error Economy..GDP.per.Capita.  Family Health..Life.Expectanc
y.
## 152        0.04324                  0.25812 0.85188                   0.271
25
##     Freedom Trust..Government.Corruption. Generosity Dystopia.Residual
## 152 0.39493                       0.12832    0.21747           1.46494
##
## $Burundi
##     Country             Region Happiness.Rank Happiness.Score Standard.Err
or
```

```
## 157 Burundi Sub-Saharan Africa            157          2.905        0.086
58
##     Economy..GDP.per.Capita.  Family Health..Life.Expectancy. Freedom
## 157                   0.0153 0.41587                  0.22396  0.1185
##     Trust..Government.Corruption. Generosity Dystopia.Residual
## 157                       0.10062    0.19727           1.83302
##
## $Cambodia
##      Country            Region Happiness.Rank Happiness.Score Standard.Err
or
## 145 Cambodia Southeastern Asia            145          3.819        0.050
69
##     Economy..GDP.per.Capita.  Family Health..Life.Expectancy. Freedom
## 145                  0.46038 0.62736                  0.61114 0.66246
##     Trust..Government.Corruption. Generosity Dystopia.Residual
## 145                       0.07247    0.40359           0.98195
##
## $Cameroon
##      Country             Region Happiness.Rank Happiness.Score Standard.Er
ror
## 133 Cameroon Sub-Saharan Africa            133          4.252        0.04
678
##     Economy..GDP.per.Capita.  Family Health..Life.Expectancy. Freedom
## 133                   0.4225 0.88767                  0.23402 0.49309
##     Trust..Government.Corruption. Generosity Dystopia.Residual
## 133                       0.05786    0.20618           1.95071
##
## $Canada
##   Country        Region Happiness.Rank Happiness.Score Standard.Error
## 5  Canada North America              5          7.427        0.03553
##   Economy..GDP.per.Capita.  Family Health..Life.Expectancy. Freedom
## 5                  1.32629 1.32261                  0.90563 0.63297
##   Trust..Government.Corruption. Generosity Dystopia.Residual
## 5                       0.32957    0.45811           2.45176
##
## $`Central African Republic`
##                      Country             Region Happiness.Rank Happiness.S
core
## 148 Central African Republic Sub-Saharan Africa            148          3
.678
##     Standard.Error Economy..GDP.per.Capita. Family Health..Life.Expectancy
.
## 148        0.06112                  0.0785      0                 0.0669
9
##     Freedom Trust..Government.Corruption. Generosity Dystopia.Residual
## 148 0.48879                       0.08289    0.23835            2.7223
##
## $Chad
##     Country             Region Happiness.Rank Happiness.Score Standard.Err
or
```

```
## 149    Chad Sub-Saharan Africa            149           3.667         0.03
83
##     Economy..GDP.per.Capita.  Family Health..Life.Expectancy. Freedom
## 149                  0.34193 0.76062                  0.1501 0.23501
##     Trust..Government.Corruption. Generosity Dystopia.Residual
## 149                       0.05269    0.18386           1.94296
##
## $Chile
##    Country                       Region Happiness.Rank Happiness.Score
## 27   Chile Latin America and Caribbean             27            6.67
##    Standard.Error Economy..GDP.per.Capita.  Family Health..Life.Expectancy
.
## 27          0.058                  1.10715 1.12447                  0.8585
7
##    Freedom Trust..Government.Corruption. Generosity Dystopia.Residual
## 27 0.44132                       0.12869    0.33363           2.67585
##
## $China
##    Country       Region Happiness.Rank Happiness.Score Standard.Error
## 84   China Eastern Asia              84            5.14        0.02424
##    Economy..GDP.per.Capita.  Family Health..Life.Expectancy. Freedom
## 84                  0.89012 0.94675                  0.81658 0.51697
##    Trust..Government.Corruption. Generosity Dystopia.Residual
## 84                       0.02781    0.08185            1.8604
##
## $Colombia
##     Country                       Region Happiness.Rank Happiness.Score
## 33 Colombia Latin America and Caribbean             33           6.477
##    Standard.Error Economy..GDP.per.Capita.  Family Health..Life.Expectancy
.
## 33        0.05051                  0.91861 1.24018                  0.6907
7
##    Freedom Trust..Government.Corruption. Generosity Dystopia.Residual
## 33 0.53466                       0.0512    0.18401           2.85737
##
##  [ reached getOption("max.print") -- omitted 128 entries ]
```

length() function: returns the number of elements in a vector

```
length(dataset)
```

```
## [1] 12
```

Counting the number of unique values in a column:

```
unique_count <- length(unique(dataset$Country))
unique_count
```

```
## [1] 158
```

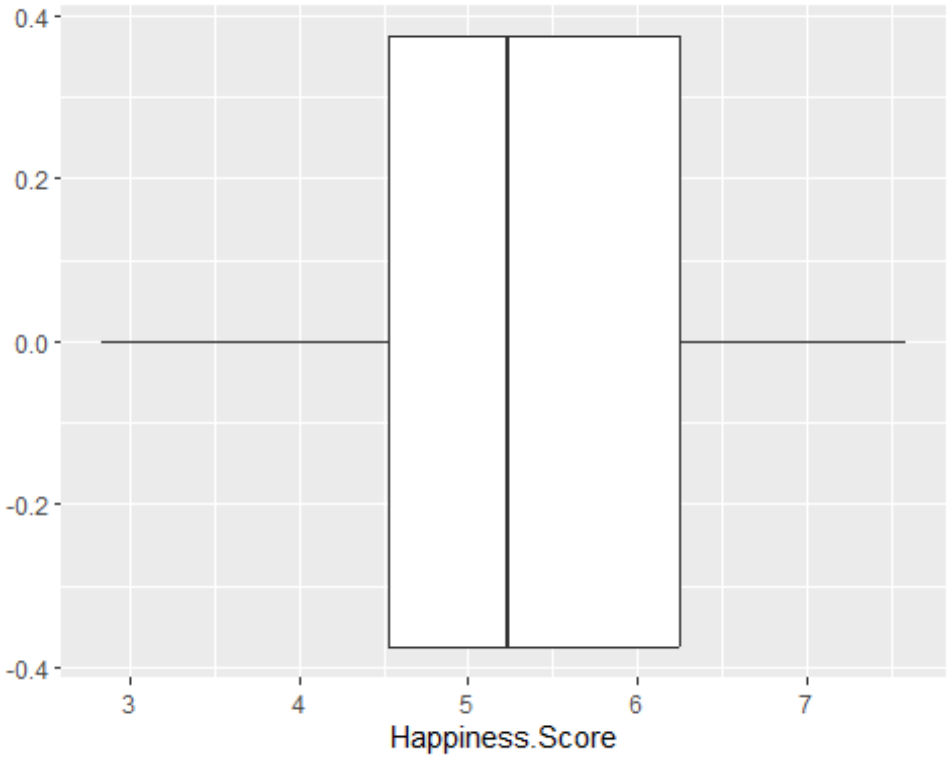
Calculate the percentage of missing values in each column:

```
missing_percentage <- colMeans(is.na(dataset)) * 100
missing_percentage
```

```
##                        Country                         Region
##                              0                              0
##                 Happiness.Rank                Happiness.Score
##                              0                              0
##                 Standard.Error      Economy..GDP.per.Capita.
##                              0                              0
##                         Family      Health..Life.Expectancy.
##                              0                              0
##                        Freedom Trust..Government.Corruption.
##                              0                              0
##                     Generosity             Dystopia.Residual
##                              0                              0
```

to draw a boxplot

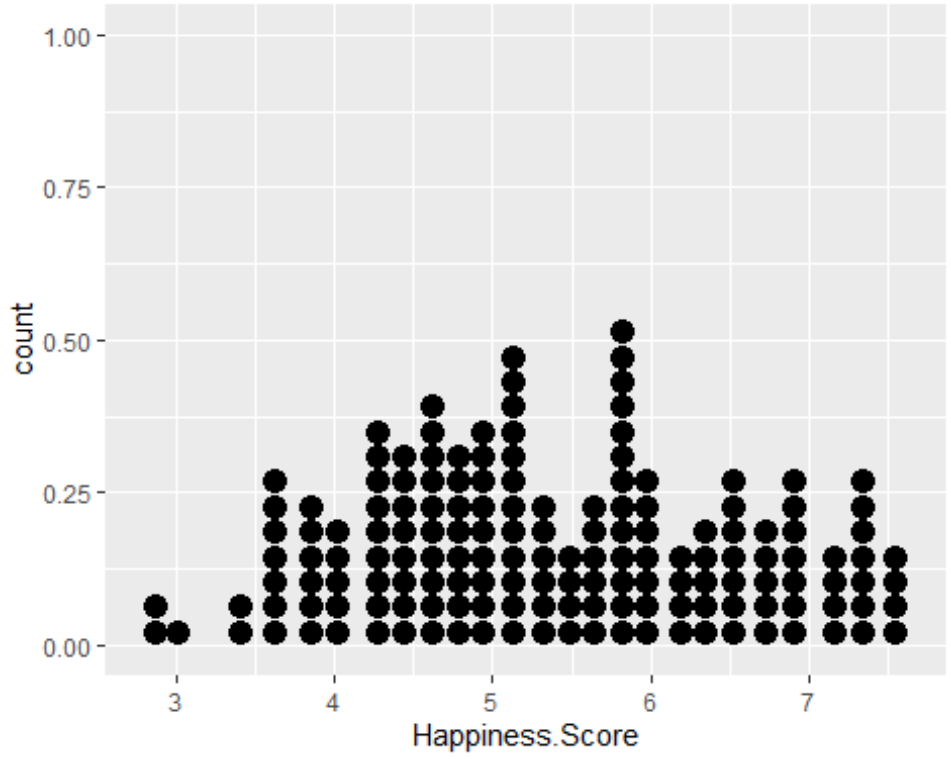
```
ggplot(dataset,aes(x=Happiness.Score))+geom_boxplot()
```



to draw a dot plot

```
ggplot(dataset,aes(x=Happiness.Score))+geom_dotplot()
```

```
## Bin width defaults to 1/30 of the range of the data. Pick better value wit
h
## `binwidth`.
```



to draw density graph

```
ggplot(dataset,aes(x=Happiness.Score))+geom_density()
```