Assignment_1

Hannah Cronin

2022-09-11

This dataset from Kaggle is about the nutrional facts of various cereals.

```
cereal <- read.csv("~/Downloads/cereal.csv") #URL:https://www.kaggle.com/datasets/crawfo
rd/80-cereals?resource=download
```

```
head(cereal) #first 6 rows of data
```

```
##                          name mfr type calories protein fat sodium fiber carbo
## 1                    100% Bran   N    C       70       4   1    130  10.0   5.0
## 2            100% Natural Bran   Q    C      120       3   5     15   2.0   8.0
## 3                      All-Bran   K    C       70       4   1    260   9.0   7.0
## 4   All-Bran with Extra Fiber   K    C       50       4   0    140  14.0   8.0
## 5               Almond Delight   R    C      110       2   2    200   1.0  14.0
## 6       Apple Cinnamon Cheerios   G    C      110       2   2    180   1.5  10.5
##     sugars potass vitamins shelf weight cups    rating
## 1        6    280       25     3      1 0.33 68.40297
## 2        8    135        0     3      1 1.00 33.98368
## 3        5    320       25     3      1 0.33 59.42551
## 4        0    330       25     3      1 0.50 93.70491
## 5        8     -1       25     3      1 0.75 34.38484
## 6       10     70       25     1      1 0.75 29.50954
```

```
summary(cereal) #means and quartile info of all quantitative variables
```

```
##      name                mfr                 type              calories
## Length:77          Length:77          Length:77          Min.   : 50.0
## Class :character   Class :character   Class :character   1st Qu.:100.0
## Mode  :character   Mode  :character   Mode  :character   Median :110.0
##                                                          Mean   :106.9
##                                                          3rd Qu.:110.0
##                                                          Max.   :160.0
##    protein            fat            sodium            fiber
## Min.   :1.000   Min.   :0.000   Min.   :  0.0   Min.   : 0.000
## 1st Qu.:2.000   1st Qu.:0.000   1st Qu.:130.0   1st Qu.: 1.000
## Median :3.000   Median :1.000   Median :180.0   Median : 2.000
## Mean   :2.545   Mean   :1.013   Mean   :159.7   Mean   : 2.152
## 3rd Qu.:3.000   3rd Qu.:2.000   3rd Qu.:210.0   3rd Qu.: 3.000
## Max.   :6.000   Max.   :5.000   Max.   :320.0   Max.   :14.000
##    carbo            sugars            potass           vitamins
## Min.   :-1.0    Min.   :-1.000   Min.   : -1.00   Min.   :  0.00
## 1st Qu.:12.0    1st Qu.: 3.000   1st Qu.: 40.00   1st Qu.: 25.00
## Median :14.0    Median : 7.000   Median : 90.00   Median : 25.00
## Mean   :14.6    Mean   : 6.922   Mean   : 96.08   Mean   : 28.25
## 3rd Qu.:17.0    3rd Qu.:11.000   3rd Qu.:120.00   3rd Qu.: 25.00
## Max.   :23.0    Max.   :15.000   Max.   :330.00   Max.   :100.00
##    shelf            weight            cups              rating
## Min.   :1.000   Min.   :0.50    Min.   :0.250    Min.   :18.04
## 1st Qu.:1.000   1st Qu.:1.00    1st Qu.:0.670    1st Qu.:33.17
## Median :2.000   Median :1.00    Median :0.750    Median :40.40
## Mean   :2.208   Mean   :1.03    Mean   :0.821    Mean   :42.67
## 3rd Qu.:3.000   3rd Qu.:1.00    3rd Qu.:1.000    3rd Qu.:50.83
## Max.   :3.000   Max.   :1.50    Max.   :1.500    Max.   :93.70
```

```r
tapply(cereal$rating,cereal$mfr,summary) #mean/quartiles of each cereal manufacturer
```

```
## $A
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   54.85   54.85   54.85   54.85   54.85   54.85
##
## $G
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   19.82   27.96   36.18   34.49   39.59   51.59
##
## $K
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   29.92   34.48   40.56   44.04   50.01   93.70
##
## $N
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   59.36   65.46   68.32   67.97   71.70   74.47
##
## $P
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   28.03   35.25   40.92   41.71   52.08   53.37
##
## $Q
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   18.04   30.96   47.42   42.92   53.31   63.01
##
## $R
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   34.14   36.45   41.72   41.54   45.53   49.79
```

```r
library(dplyr) #load in dplyr package
```

```
##
## 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
```

```r
mutate(cereal, weight_grams = weight * 28.34952) #transformed weight from ounces into gr
ams
```

```
##                                  name mfr type calories protein fat sodium
## 1                            100% Bran   N   C       70       4   1    130
## 2                    100% Natural Bran   Q   C      120       3   5     15
## 3                             All-Bran   K   C       70       4   1    260
## 4             All-Bran with Extra Fiber  K   C       50       4   0    140
## 5                       Almond Delight   R   C      110       2   2    200
## 6               Apple Cinnamon Cheerios   G   C      110       2   2    180
## 7                          Apple Jacks   K   C      110       2   0    125
## 8                              Basic 4   G   C      130       3   2    210
## 9                            Bran Chex   R   C       90       2   1    200
## 10                          Bran Flakes  P   C       90       3   0    210
## 11                         Cap'n'Crunch  Q   C      120       1   2    220
## 12                             Cheerios  G   C      110       6   2    290
## 13             Cinnamon Toast Crunch     G   C      120       1   3    210
## 14                             Clusters  G   C      110       3   2    140
## 15                          Cocoa Puffs  G   C      110       1   1    180
## 16                            Corn Chex  R   C      110       2   0    280
## 17                          Corn Flakes  K   C      100       2   0    290
## 18                            Corn Pops  K   C      110       1   0     90
## 19                        Count Chocula  G   C      110       1   1    180
## 20                   Cracklin' Oat Bran  K   C      110       3   3    140
## 21                Cream of Wheat (Quick) N   H      100       3   0     80
## 22                              Crispix  K   C      110       2   0    220
## 23               Crispy Wheat & Raisins  G   C      100       2   1    140
## 24                          Double Chex  R   C      100       2   0    190
## 25                           Froot Loops K   C      110       2   1    125
## 26                       Frosted Flakes  K   C      110       1   0    200
## 27                  Frosted Mini-Wheats  K   C      100       3   0      0
## 28 Fruit & Fibre Dates; Walnuts; and Oats P  C      120       3   2    160
## 29                        Fruitful Bran  K   C      120       3   0    240
## 30                        Fruity Pebbles P   C      110       1   1    135
## 31                         Golden Crisp  P   C      100       2   0     45
## 32                       Golden Grahams  G   C      110       1   1    280
## 33                     Grape Nuts Flakes P   C      100       3   1    140
## 34                           Grape-Nuts  P   C      110       3   0    170
## 35                    Great Grains Pecan P   C      120       3   3     75
## 36                       Honey Graham Ohs Q  C      120       1   2    220
## 37                  Honey Nut Cheerios   G   C      110       3   1    250
## 38                          Honey-comb  P   C      110       1   0    180
## 39           Just Right Crunchy  Nuggets K   C      110       2   1    170
## 40               Just Right Fruit & Nut  K   C      140       3   1    170
## 41                                  Kix  G   C      110       2   1    260
## 42                                 Life  Q   C      100       4   2    150
## 43                         Lucky Charms  G   C      110       2   1    180
## 44                                Maypo  A   H      100       4   1      0
## 45      Muesli Raisins; Dates; & Almonds R   C      150       4   3     95
## 46     Muesli Raisins; Peaches; & Pecans R   C      150       4   3    150
## 47                 Mueslix Crispy Blend  K   C      160       3   2    150
## 48                 Multi-Grain Cheerios  G   C      100       2   1    220
## 49                     Nut&Honey Crunch  K   C      120       2   1    190
## 50            Nutri-Grain Almond-Raisin  K   C      140       3   2    220
## 51                   Nutri-grain Wheat   K   C       90       3   0    170
```

```
## 52              Oatmeal Raisin Crisp   G   C     130    3   2    170
## 53             Post Nat. Raisin Bran   P   C     120    3   1    200
## 54                        Product 19   K   C     100    3   0    320
## 55                       Puffed Rice   Q   C      50    1   0      0
## 56                      Puffed Wheat   Q   C      50    2   0      0
## 57                Quaker Oat Squares   Q   C     100    4   1    135
## 58                    Quaker Oatmeal   Q   H     100    5   2      0
## 59                       Raisin Bran   K   C     120    3   1    210
## 60                   Raisin Nut Bran   G   C     100    3   2    140
## 61                    Raisin Squares   K   C      90    2   0      0
## 62                         Rice Chex   R   C     110    1   0    240
## 63                     Rice Krispies   K   C     110    2   0    290
## 64                    Shredded Wheat   N   C      80    2   0      0
## 65            Shredded Wheat 'n'Bran   N   C      90    3   0      0
## 66         Shredded Wheat spoon size   N   C      90    3   0      0
## 67                            Smacks   K   C     110    2   1     70
## 68                         Special K   K   C     110    6   0    230
## 69            Strawberry Fruit Wheats   N   C      90    2   0     15
## 70                 Total Corn Flakes   G   C     110    2   1    200
## 71                 Total Raisin Bran   G   C     140    3   1    190
## 72                 Total Whole Grain   G   C     100    3   1    200
## 73                           Triples   G   C     110    2   1    250
## 74                              Trix   G   C     110    1   1    140
## 75                        Wheat Chex   R   C     100    3   1    230
## 76                          Wheaties   G   C     100    3   1    200
## 77                Wheaties Honey Gold   G   C     110    2   1    200
##    fiber carbo sugars potass vitamins shelf weight cups   rating weight_grams
## 1   10.0   5.0      6    280       25     3   1.00 0.33 68.40297     28.34952
## 2    2.0   8.0      8    135        0     3   1.00 1.00 33.98368     28.34952
## 3    9.0   7.0      5    320       25     3   1.00 0.33 59.42551     28.34952
## 4   14.0   8.0      0    330       25     3   1.00 0.50 93.70491     28.34952
## 5    1.0  14.0      8     -1       25     3   1.00 0.75 34.38484     28.34952
## 6    1.5  10.5     10     70       25     1   1.00 0.75 29.50954     28.34952
## 7    1.0  11.0     14     30       25     2   1.00 1.00 33.17409     28.34952
## 8    2.0  18.0      8    100       25     3   1.33 0.75 37.03856     37.70486
## 9    4.0  15.0      6    125       25     1   1.00 0.67 49.12025     28.34952
## 10   5.0  13.0      5    190       25     3   1.00 0.67 53.31381     28.34952
## 11   0.0  12.0     12     35       25     2   1.00 0.75 18.04285     28.34952
## 12   2.0  17.0      1    105       25     1   1.00 1.25 50.76500     28.34952
## 13   0.0  13.0      9     45       25     2   1.00 0.75 19.82357     28.34952
## 14   2.0  13.0      7    105       25     3   1.00 0.50 40.40021     28.34952
## 15   0.0  12.0     13     55       25     2   1.00 1.00 22.73645     28.34952
## 16   0.0  22.0      3     25       25     1   1.00 1.00 41.44502     28.34952
## 17   1.0  21.0      2     35       25     1   1.00 1.00 45.86332     28.34952
## 18   1.0  13.0     12     20       25     2   1.00 1.00 35.78279     28.34952
## 19   0.0  12.0     13     65       25     2   1.00 1.00 22.39651     28.34952
## 20   4.0  10.0      7    160       25     3   1.00 0.50 40.44877     28.34952
## 21   1.0  21.0      0     -1        0     2   1.00 1.00 64.53382     28.34952
## 22   1.0  21.0      3     30       25     3   1.00 1.00 46.89564     28.34952
## 23   2.0  11.0     10    120       25     3   1.00 0.75 36.17620     28.34952
## 24   1.0  18.0      5     80       25     3   1.00 0.75 44.33086     28.34952
## 25   1.0  11.0     13     30       25     2   1.00 1.00 32.20758     28.34952
```
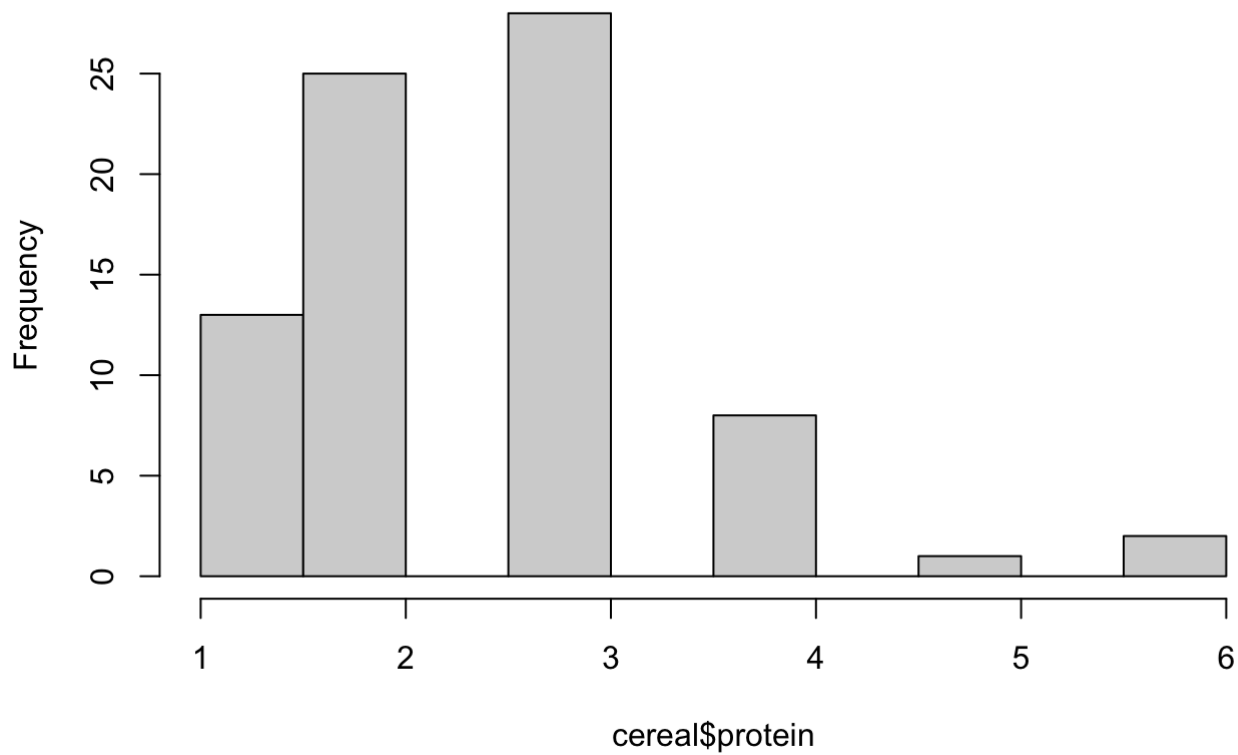
```
## 26   1.0   14.0   11    25     25    1   1.00 0.75 31.43597    28.34952
## 27   3.0   14.0    7   100     25    2   1.00 0.80 58.34514    28.34952
## 28   5.0   12.0   10   200     25    3   1.25 0.67 40.91705    35.43690
## 29   5.0   14.0   12   190     25    3   1.33 0.67 41.01549    37.70486
## 30   0.0   13.0   12    25     25    2   1.00 0.75 28.02576    28.34952
## 31   0.0   11.0   15    40     25    1   1.00 0.88 35.25244    28.34952
## 32   0.0   15.0    9    45     25    2   1.00 0.75 23.80404    28.34952
## 33   3.0   15.0    5    85     25    3   1.00 0.88 52.07690    28.34952
## 34   3.0   17.0    3    90     25    3   1.00 0.25 53.37101    28.34952
## 35   3.0   13.0    4   100     25    3   1.00 0.33 45.81172    28.34952
## 36   1.0   12.0   11    45     25    2   1.00 1.00 21.87129    28.34952
## 37   1.5   11.5   10    90     25    1   1.00 0.75 31.07222    28.34952
## 38   0.0   14.0   11    35     25    1   1.00 1.33 28.74241    28.34952
## 39   1.0   17.0    6    60    100    3   1.00 1.00 36.52368    28.34952
## 40   2.0   20.0    9    95    100    3   1.30 0.75 36.47151    36.85438
## 41   0.0   21.0    3    40     25    2   1.00 1.50 39.24111    28.34952
## 42   2.0   12.0    6    95     25    2   1.00 0.67 45.32807    28.34952
## 43   0.0   12.0   12    55     25    2   1.00 1.00 26.73451    28.34952
## 44   0.0   16.0    3    95     25    2   1.00 1.00 54.85092    28.34952
## 45   3.0   16.0   11   170     25    3   1.00 1.00 37.13686    28.34952
## 46   3.0   16.0   11   170     25    3   1.00 1.00 34.13976    28.34952
## 47   3.0   17.0   13   160     25    3   1.50 0.67 30.31335    42.52428
## 48   2.0   15.0    6    90     25    1   1.00 1.00 40.10596    28.34952
## 49   0.0   15.0    9    40     25    2   1.00 0.67 29.92429    28.34952
## 50   3.0   21.0    7   130     25    3   1.33 0.67 40.69232    37.70486
## 51   3.0   18.0    2    90     25    3   1.00 1.00 59.64284    28.34952
## 52   1.5   13.5   10   120     25    3   1.25 0.50 30.45084    35.43690
## 53   6.0   11.0   14   260     25    3   1.33 0.67 37.84059    37.70486
## 54   1.0   20.0    3    45    100    3   1.00 1.00 41.50354    28.34952
## 55   0.0   13.0    0    15      0    3   0.50 1.00 60.75611    14.17476
## 56   1.0   10.0    0    50      0    3   0.50 1.00 63.00565    14.17476
## 57   2.0   14.0    6   110     25    3   1.00 0.50 49.51187    28.34952
## 58   2.7   -1.0   -1   110      0    1   1.00 0.67 50.82839    28.34952
## 59   5.0   14.0   12   240     25    2   1.33 0.75 39.25920    37.70486
## 60   2.5   10.5    8   140     25    3   1.00 0.50 39.70340    28.34952
## 61   2.0   15.0    6   110     25    3   1.00 0.50 55.33314    28.34952
## 62   0.0   23.0    2    30     25    1   1.00 1.13 41.99893    28.34952
## 63   0.0   22.0    3    35     25    1   1.00 1.00 40.56016    28.34952
## 64   3.0   16.0    0    95      0    1   0.83 1.00 68.23588    23.53010
## 65   4.0   19.0    0   140      0    1   1.00 0.67 74.47295    28.34952
## 66   3.0   20.0    0   120      0    1   1.00 0.67 72.80179    28.34952
## 67   1.0    9.0   15    40     25    2   1.00 0.75 31.23005    28.34952
## 68   1.0   16.0    3    55     25    1   1.00 1.00 53.13132    28.34952
## 69   3.0   15.0    5    90     25    2   1.00 1.00 59.36399    28.34952
## 70   0.0   21.0    3    35    100    3   1.00 1.00 38.83975    28.34952
## 71   4.0   15.0   14   230    100    3   1.50 1.00 28.59278    42.52428
## 72   3.0   16.0    3   110    100    3   1.00 1.00 46.65884    28.34952
## 73   0.0   21.0    3    60     25    3   1.00 0.75 39.10617    28.34952
## 74   0.0   13.0   12    25     25    2   1.00 1.00 27.75330    28.34952
## 75   3.0   17.0    3   115     25    1   1.00 0.67 49.78744    28.34952
## 76   3.0   17.0    3   110     25    1   1.00 1.00 51.59219    28.34952
## 77   1.0   16.0    8    60     25    1   1.00 0.75 36.18756    28.34952
```

```
hist(cereal$protein) #one quantitative variable
```

Histogram of cereal$protein


```
plot(cereal$calories,cereal$sugars) #scatter plot of calories/sugars
```