

Assignment 2 – Data Analysis using R Programming

2022-04-08

R Datasets

Using UScereal Dataset from the library Mass

```
library(MASS)
??UScereal
```

R Datasets

Creating a new dataframe

```
UScereal1 <- UScereal
```

Printing the Structure of the dataset

```
str(UScereal1)

## 'data.frame':    65 obs. of  11 variables:
## $ mfr       : Factor w/ 6 levels "G","K","N","P",...: 3 2 2 1 2 1 6 4 5 1 ...
## $ calories  : num  212 212 100 147 110 ...
## $ protein   : num  12.12 12.12 8 2.67 2 ...
## $ fat       : num  3.03 3.03 0 2.67 0 ...
## $ sodium    : num  394 788 280 240 125 ...
## $ fibre     : num  30.3 27.3 28 2 1 ...
## $ carbo     : num  15.2 21.2 16 14 11 ...
## $ sugars    : num  18.2 15.2 0 13.3 14 ...
## $ shelf     : int   3 3 3 1 2 3 1 3 2 1 ...
## $ potassium : num  848.5 969.7 660 93.3 30 ...
## $ vitamins  : Factor w/ 3 levels "100%","enriched",...: 2 2 2 2 2 2 2 2 2 2 ...
```

Listing the variables inside the dataset

```
names(UScereal1)

## [1] "mfr"      "calories" "protein"  "fat"      "sodium"   "fibre"
## [7] "carbo"    "sugars"   "shelf"    "potassium" "vitamins"
```

Printing top 15 rows of the dataset

```
head(UScereal1, 15)

##           mfr calories  protein    fat  sodium   fibre
## 100% Bran      N 212.1212 12.121212 3.030303 393.9394 30.303030
## All-Bran       K 212.1212 12.121212 3.030303 787.8788 27.272727
## All-Bran with Extra Fiber K 100.0000 8.000000 0.000000 280.0000 28.000000
## Apple Cinnamon Cheerios G 146.6667 2.666667 2.666667 240.0000 2.000000
## Apple Jacks    K 110.0000 2.000000 0.000000 125.0000 1.000000
## Basic 4        G 173.3333 4.000000 2.666667 280.0000 2.666667
## Bran Chex      R 134.3284 2.985075 1.492537 298.5075 5.970149
## Bran Flakes    P 134.3284 4.477612 0.000000 313.4328 7.462687
```

```
## Cap'n'Crunch      Q 160.0000  1.333333  2.666667  293.3333  0.000000
## Cheerios          G  88.0000  4.800000  1.600000  232.0000  1.600000
## Cinnamon Toast Crunch G 160.0000  1.333333  4.000000  280.0000  0.000000
## Clusters          G 220.0000  6.000000  4.000000  280.0000  4.000000
## Cocoa Puffs       G 110.0000  1.000000  1.000000  180.0000  0.000000
## Corn Chex         R 110.0000  2.000000  0.000000  280.0000  0.000000
## Corn Flakes       K 100.0000  2.000000  0.000000  290.0000  1.000000
##                  carbo  sugars shelf potassium vitamins
## 100% Bran          15.15152 18.181818    3 848.48485 enriched
## All-Bran           21.21212 15.151515    3 969.69697 enriched
## All-Bran with Extra Fiber 16.00000  0.000000    3 660.00000 enriched
## Apple Cinnamon Cheerios 14.00000 13.333333    1  93.33333 enriched
## Apple Jacks        11.00000 14.000000    2  30.00000 enriched
## Basic 4            24.00000 10.666667    3 133.33333 enriched
## Bran Chex          22.38806  8.955224    1 186.56716 enriched
## Bran Flakes        19.40299  7.462687    3 283.58209 enriched
## Cap'n'Crunch       16.00000 16.000000    2  46.66667 enriched
## Cheerios           13.60000  0.800000    1  84.00000 enriched
## Cinnamon Toast Crunch 17.33333 12.000000    2  60.00000 enriched
## Clusters           26.00000 14.000000    3 210.00000 enriched
## Cocoa Puffs        12.00000 13.000000    2  55.00000 enriched
## Corn Chex          22.00000  3.000000    1  25.00000 enriched
## Corn Flakes        21.00000  2.000000    1  35.00000 enriched
```

User defined function for one variable Finding the average of any given variable

```
ave<-function(x){ mn<-mean(x)
return(mn) }
ave(UScereal1$potassium)
```

```
## [1] 159.1197
```

Use data manipulation techniques and filter rows based on any logical criteria that exist in your dataset.
Filtering for any manufacturer

```
manu1 <- UScereal1[UScereal1$mfr=='K',]
head(manu1)
```

```
##                  mfr calories  protein    fat  sodium  fibre
## All-Bran          K 212.1212 12.12121 3.030303 787.8788 27.27273
## All-Bran with Extra Fiber K 100.0000  8.00000 0.000000 280.0000 28.00000
## Apple Jacks       K 110.0000  2.00000 0.000000 125.0000  1.00000
## Corn Flakes       K 100.0000  2.00000 0.000000 290.0000  1.00000
## Corn Pops         K 110.0000  1.00000 0.000000  90.0000  1.00000
## Cracklin' Oat Bran K 220.0000  6.00000 6.000000 280.0000  8.00000
##                  carbo  sugars shelf potassium vitamins
## All-Bran          21.21212 15.15151    3  969.697 enriched
## All-Bran with Extra Fiber 16.00000  0.00000    3  660.000 enriched
## Apple Jacks        11.00000 14.00000    2   30.000 enriched
## Corn Flakes        21.00000  2.00000    1   35.000 enriched
## Corn Pops          13.00000 12.00000    2   20.000 enriched
## Cracklin' Oat Bran  20.00000 14.00000    3  320.000 enriched
```

Identify the dependent & independent variables and use reshaping techniques and create a new data frame by joining those variables from your dataset.

```
library(tidyr)
UScereal_long <- gather(UScereal1, market_info, value, calories:vitamins, factor_key=TRUE)
```

```
## Warning: attributes are not identical across measure variables;
## they will be dropped
```

```
UScereal_long
```

```
##      mfr market_info      value
## 1      N    calories 212.12121
## 2      K    calories 212.12121
## 3      K    calories      100
## 4      G    calories 146.66667
## 5      K    calories      110
## 6      G    calories 173.33333
## 7      R    calories 134.32836
## 8      P    calories 134.32836
## 9      Q    calories      160
## 10     G    calories       88
## 11     G    calories      160
## 12     G    calories      220
## 13     G    calories      110
## 14     R    calories      110
## 15     K    calories      100
## 16     K    calories      110
## 17     G    calories      110
## 18     K    calories      220
## 19     K    calories      110
## 20     G    calories 133.33333
## 21     R    calories 133.33333
## 22     K    calories      110
## 23     K    calories 146.66667
## 24     K    calories      125
## 25     P    calories 179.10448
## 26     K    calories 179.10448
## 27     P    calories 146.66667
## 28     P    calories 113.63636
## 29     G    calories 146.66667
## 30     P    calories 113.63636
## 31     P    calories      440
## 32     P    calories 363.63636
## 33     Q    calories      120
## 34     G    calories 146.66667
## 35     P    calories  82.70677
## 36     K    calories 186.66667
## 37     G    calories  73.33333
## 38     Q    calories 149.25373
## 39     G    calories      110
## 40     K    calories 238.80597
## 41     G    calories      100
## 42     K    calories 179.10448
## 43     K    calories 208.95522
## 44     G    calories      260
## 45     P    calories 179.10448
```

```
## 46    K    calories      100
## 47    Q    calories       50
## 48    Q    calories     200
## 49    K    calories     160
## 50    G    calories     200
## 51    K    calories     180
## 52    R    calories  97.34513
## 53    K    calories     110
## 54    N    calories 134.32836
## 55    N    calories 134.32836
## 56    K    calories 146.66667
## 57    K    calories     110
## 58    G    calories     110
## 59    G    calories     140
## 60    G    calories     100
## 61    G    calories 146.66667
## 62    G    calories     110
## 63    R    calories 149.25373
## 64    G    calories     100
## 65    G    calories 146.66667
## 66    N    protein 12.1212121
## 67    K    protein 12.1212121
## 68    K    protein      8
## 69    G    protein  2.6666667
## 70    K    protein      2
## 71    G    protein      4
## 72    R    protein  2.9850746
## 73    P    protein  4.4776119
## 74    Q    protein  1.3333333
## 75    G    protein      4.8
## 76    G    protein  1.3333333
## 77    G    protein      6
## 78    G    protein      1
## 79    R    protein      2
## 80    K    protein      2
## 81    K    protein      1
## 82    G    protein      1
## 83    K    protein      6
## 84    K    protein      2
## 85    G    protein  2.6666667
## 86    R    protein  2.6666667
## 87    K    protein      2
## 88    K    protein  1.3333333
## 89    K    protein      3.75
## 90    P    protein  4.4776119
## 91    K    protein  4.4776119
## 92    P    protein  1.3333333
## 93    P    protein  2.2727273
## 94    G    protein  1.3333333
## 95    P    protein  3.4090909
## 96    P    protein     12
## 97    P    protein  9.0909091
## 98    Q    protein      1
## 99    G    protein      4
```

```
## 100 P      protein 0.7518797
## 101 K      protein      4
## 102 G      protein 1.3333333
## 103 Q      protein 5.9701493
## 104 G      protein      2
## 105 K      protein 4.4776119
## 106 G      protein      2
## 107 K      protein 2.9850746
## 108 K      protein 4.4776119
## 109 G      protein      6
## 110 P      protein 4.4776119
## 111 K      protein      3
## 112 Q      protein      1
## 113 Q      protein      8
## 114 K      protein      4
## 115 G      protein      6
## 116 K      protein      4
## 117 R      protein 0.8849558
## 118 K      protein      2
## 119 N      protein 4.4776119
## 120 N      protein 4.4776119
## 121 K      protein 2.6666667
## 122 K      protein      6
## 123 G      protein      2
## 124 G      protein      3
## 125 G      protein      3
## 126 G      protein 2.6666667
## 127 G      protein      1
## 128 R      protein 4.4776119
## 129 G      protein      3
## 130 G      protein 2.6666667
## 131 N              fat 3.030303
## 132 K              fat 3.030303
## 133 K              fat      0
## 134 G              fat 2.6666667
## 135 K              fat      0
## 136 G              fat 2.6666667
## 137 R              fat 1.4925373
## 138 P              fat      0
## 139 Q              fat 2.6666667
## 140 G              fat      1.6
## 141 G              fat      4
## 142 G              fat      4
## 143 G              fat      1
## 144 R              fat      0
## 145 K              fat      0
## 146 K              fat      0
## 147 G              fat      1
## 148 K              fat      6
## 149 K              fat      0
## 150 G              fat 1.3333333
## 151 R              fat      0
## 152 K              fat      1
## 153 K              fat      0
```

```
## 154 K fat 0
## 155 P fat 2.9850746
## 156 K fat 0
## 157 P fat 1.3333333
## 158 P fat 0
## 159 G fat 1.3333333
## 160 P fat 1.1363636
## 161 P fat 0
## 162 P fat 9.0909091
## 163 Q fat 2
## 164 G fat 1.3333333
## 165 P fat 0
## 166 K fat 1.3333333
## 167 G fat 0.6666667
## 168 Q fat 2.9850746
## 169 G fat 1
## 170 K fat 2.9850746
## 171 G fat 1
## 172 K fat 1.4925373
## 173 K fat 2.9850746
## 174 G fat 4
## 175 P fat 1.4925373
## 176 K fat 0
## 177 Q fat 0
## 178 Q fat 2
## 179 K fat 1.3333333
## 180 G fat 4
## 181 K fat 0
## 182 R fat 0
## 183 K fat 0
## 184 N fat 0
## 185 N fat 0
## 186 K fat 1.3333333
## 187 K fat 0
## 188 G fat 1
## 189 G fat 1
## 190 G fat 1
## 191 G fat 1.3333333
## 192 G fat 1
## 193 R fat 1.4925373
## 194 G fat 1
## 195 G fat 1.3333333
## 196 N sodium 393.93939
## 197 K sodium 787.87879
## 198 K sodium 280
## 199 G sodium 240
## 200 K sodium 125
## 201 G sodium 280
## 202 R sodium 298.50746
## 203 P sodium 313.43284
## 204 Q sodium 293.33333
## 205 G sodium 232
## 206 G sodium 280
## 207 G sodium 280
```

```
## 208 G sodium 180
## 209 R sodium 280
## 210 K sodium 290
## 211 K sodium 90
## 212 G sodium 180
## 213 K sodium 280
## 214 K sodium 220
## 215 G sodium 186.66667
## 216 R sodium 253.33333
## 217 K sodium 125
## 218 K sodium 266.66667
## 219 K sodium 0
## 220 P sodium 238.80597
## 221 K sodium 358.20896
## 222 P sodium 180
## 223 P sodium 51.13636
## 224 G sodium 373.33333
## 225 P sodium 159.09091
## 226 P sodium 680
## 227 P sodium 227.27273
## 228 Q sodium 220
## 229 G sodium 333.33333
## 230 P sodium 135.33835
## 231 K sodium 226.66667
## 232 G sodium 173.33333
## 233 Q sodium 223.8806
## 234 G sodium 180
## 235 K sodium 223.8806
## 236 G sodium 220
## 237 K sodium 283.58209
## 238 K sodium 328.35821
## 239 G sodium 340
## 240 P sodium 298.50746
## 241 K sodium 320
## 242 Q sodium 0
## 243 Q sodium 270
## 244 K sodium 280
## 245 G sodium 280
## 246 K sodium 0
## 247 R sodium 212.38938
## 248 K sodium 290
## 249 N sodium 0
## 250 N sodium 0
## 251 K sodium 93.33333
## 252 K sodium 230
## 253 G sodium 200
## 254 G sodium 190
## 255 G sodium 200
## 256 G sodium 333.33333
## 257 G sodium 140
## 258 R sodium 343.28358
## 259 G sodium 200
## 260 G sodium 266.66667
## 261 N fibre 30.30303
```

```
## 262 K fibre 27.272727
## 263 K fibre 28
## 264 G fibre 2
## 265 K fibre 1
## 266 G fibre 2.666667
## 267 R fibre 5.970149
## 268 P fibre 7.462687
## 269 Q fibre 0
## 270 G fibre 1.6
## 271 G fibre 0
## 272 G fibre 4
## 273 G fibre 0
## 274 R fibre 0
## 275 K fibre 1
## 276 K fibre 1
## 277 G fibre 0
## 278 K fibre 8
## 279 K fibre 1
## 280 G fibre 2.666667
## 281 R fibre 1.333333
## 282 K fibre 1
## 283 K fibre 1.333333
## 284 K fibre 3.75
## 285 P fibre 7.462687
## 286 K fibre 7.462687
## 287 P fibre 0
## 288 P fibre 0
## 289 G fibre 0
## 290 P fibre 3.409091
## 291 P fibre 12
## 292 P fibre 9.090909
## 293 Q fibre 1
## 294 G fibre 2
## 295 P fibre 0
## 296 K fibre 2.666667
## 297 G fibre 0
## 298 Q fibre 2.985075
## 299 G fibre 0
## 300 K fibre 4.477612
## 301 G fibre 2
## 302 K fibre 0
## 303 K fibre 4.477612
## 304 G fibre 3
## 305 P fibre 8.955224
## 306 K fibre 1
## 307 Q fibre 0
## 308 Q fibre 4
## 309 K fibre 6.666667
## 310 G fibre 5
## 311 K fibre 4
## 312 R fibre 0
## 313 K fibre 0
## 314 N fibre 5.970149
## 315 N fibre 4.477612
```



```
## 316 K fibre 1.333333
## 317 K fibre 1
## 318 G fibre 0
## 319 G fibre 4
## 320 G fibre 3
## 321 G fibre 0
## 322 G fibre 0
## 323 R fibre 4.477612
## 324 G fibre 3
## 325 G fibre 1.333333
## 326 N carbo 15.15152
## 327 K carbo 21.21212
## 328 K carbo 16
## 329 G carbo 14
## 330 K carbo 11
## 331 G carbo 24
## 332 R carbo 22.38806
## 333 P carbo 19.40299
## 334 Q carbo 16
## 335 G carbo 13.6
## 336 G carbo 17.33333
## 337 G carbo 26
## 338 G carbo 12
## 339 R carbo 22
## 340 K carbo 21
## 341 K carbo 13
## 342 G carbo 12
## 343 K carbo 20
## 344 K carbo 21
## 345 G carbo 14.66667
## 346 R carbo 24
## 347 K carbo 11
## 348 K carbo 18.66667
## 349 K carbo 17.5
## 350 P carbo 17.91045
## 351 K carbo 20.89552
## 352 P carbo 17.33333
## 353 P carbo 12.5
## 354 G carbo 20
## 355 P carbo 17.04545
## 356 P carbo 68
## 357 P carbo 39.39394
## 358 Q carbo 12
## 359 G carbo 15.33333
## 360 P carbo 10.52632
## 361 K carbo 26.66667
## 362 G carbo 14
## 363 Q carbo 17.91045
## 364 G carbo 12
## 365 K carbo 25.37313
## 366 G carbo 15
## 367 K carbo 22.38806
## 368 K carbo 31.34328
## 369 G carbo 27
```

```
## 370 P      carbo  16.41791
## 371 K      carbo      20
## 372 Q      carbo      13
## 373 Q      carbo      28
## 374 K      carbo  18.66667
## 375 G      carbo      21
## 376 K      carbo      30
## 377 R      carbo  20.35398
## 378 K      carbo      22
## 379 N      carbo  28.35821
## 380 N      carbo  29.85075
## 381 K      carbo      12
## 382 K      carbo      16
## 383 G      carbo      21
## 384 G      carbo      15
## 385 G      carbo      16
## 386 G      carbo      28
## 387 G      carbo      13
## 388 R      carbo  25.37313
## 389 G      carbo      17
## 390 G      carbo  21.33333
## 391 N      sugars  18.181818
## 392 K      sugars  15.151515
## 393 K      sugars      0
## 394 G      sugars  13.333333
## 395 K      sugars      14
## 396 G      sugars  10.666667
## 397 R      sugars   8.955224
## 398 P      sugars   7.462687
## 399 Q      sugars      16
## 400 G      sugars      0.8
## 401 G      sugars      12
## 402 G      sugars      14
## 403 G      sugars      13
## 404 R      sugars      3
## 405 K      sugars      2
## 406 K      sugars      12
## 407 G      sugars      13
## 408 K      sugars      14
## 409 K      sugars      3
## 410 G      sugars  13.333333
## 411 R      sugars   6.666667
## 412 K      sugars      13
## 413 K      sugars  14.666667
## 414 K      sugars      8.75
## 415 P      sugars  14.925373
## 416 K      sugars  17.910448
## 417 P      sugars      16
## 418 P      sugars  17.045455
## 419 G      sugars      12
## 420 P      sugars   5.681818
## 421 P      sugars      12
## 422 P      sugars  12.121212
## 423 Q      sugars      11
```

```
## 424 G sugars 13.333333
## 425 P sugars 8.270677
## 426 K sugars 12
## 427 G sugars 2
## 428 Q sugars 8.955224
## 429 G sugars 12
## 430 K sugars 19.402985
## 431 G sugars 6
## 432 K sugars 13.432836
## 433 K sugars 10.447761
## 434 G sugars 20
## 435 P sugars 20.895522
## 436 K sugars 3
## 437 Q sugars 0
## 438 Q sugars 12
## 439 K sugars 16
## 440 G sugars 16
## 441 K sugars 12
## 442 R sugars 1.769912
## 443 K sugars 3
## 444 N sugars 0
## 445 N sugars 0
## 446 K sugars 20
## 447 K sugars 3
## 448 G sugars 3
## 449 G sugars 14
## 450 G sugars 3
## 451 G sugars 4
## 452 G sugars 12
## 453 R sugars 4.477612
## 454 G sugars 3
## 455 G sugars 10.666667
## 456 N shelf 3
## 457 K shelf 3
## 458 K shelf 3
## 459 G shelf 1
## 460 K shelf 2
## 461 G shelf 3
## 462 R shelf 1
## 463 P shelf 3
## 464 Q shelf 2
## 465 G shelf 1
## 466 G shelf 2
## 467 G shelf 3
## 468 G shelf 2
## 469 R shelf 1
## 470 K shelf 1
## 471 K shelf 2
## 472 G shelf 2
## 473 K shelf 3
## 474 K shelf 3
## 475 G shelf 3
## 476 R shelf 3
## 477 K shelf 2
```

```
## 478 K shelf 1
## 479 K shelf 2
## 480 P shelf 3
## 481 K shelf 3
## 482 P shelf 2
## 483 P shelf 1
## 484 G shelf 2
## 485 P shelf 3
## 486 P shelf 3
## 487 P shelf 3
## 488 Q shelf 2
## 489 G shelf 1
## 490 P shelf 1
## 491 K shelf 3
## 492 G shelf 2
## 493 Q shelf 2
## 494 G shelf 2
## 495 K shelf 3
## 496 G shelf 1
## 497 K shelf 2
## 498 K shelf 3
## 499 G shelf 3
## 500 P shelf 3
## 501 K shelf 3
## 502 Q shelf 3
## 503 Q shelf 3
## 504 K shelf 2
## 505 G shelf 3
## 506 K shelf 3
## 507 R shelf 1
## 508 K shelf 1
## 509 N shelf 1
## 510 N shelf 1
## 511 K shelf 2
## 512 K shelf 1
## 513 G shelf 3
## 514 G shelf 3
## 515 G shelf 3
## 516 G shelf 3
## 517 G shelf 2
## 518 R shelf 1
## 519 G shelf 1
## 520 G shelf 1
## 521 N potassium 848.48485
## 522 K potassium 969.69697
## 523 K potassium 660
## 524 G potassium 93.33333
## 525 K potassium 30
## 526 G potassium 133.33333
## 527 R potassium 186.56716
## 528 P potassium 283.58209
## 529 Q potassium 46.66667
## 530 G potassium 84
## 531 G potassium 60
```

```
## 532 G potassium 210
## 533 G potassium 55
## 534 R potassium 25
## 535 K potassium 35
## 536 K potassium 20
## 537 G potassium 65
## 538 K potassium 320
## 539 K potassium 30
## 540 G potassium 160
## 541 R potassium 106.66667
## 542 K potassium 30
## 543 K potassium 33.33333
## 544 K potassium 125
## 545 P potassium 298.50746
## 546 K potassium 283.58209
## 547 P potassium 33.33333
## 548 P potassium 45.45455
## 549 G potassium 60
## 550 P potassium 96.59091
## 551 P potassium 360
## 552 P potassium 303.0303
## 553 Q potassium 45
## 554 G potassium 120
## 555 P potassium 26.31579
## 556 K potassium 126.66667
## 557 G potassium 26.66667
## 558 Q potassium 141.79104
## 559 G potassium 55
## 560 K potassium 238.80597
## 561 G potassium 90
## 562 K potassium 59.70149
## 563 K potassium 194.02985
## 564 G potassium 240
## 565 P potassium 388.0597
## 566 K potassium 45
## 567 Q potassium 15
## 568 Q potassium 220
## 569 K potassium 320
## 570 G potassium 280
## 571 K potassium 220
## 572 R potassium 26.54867
## 573 K potassium 35
## 574 N potassium 208.95522
## 575 N potassium 179.10448
## 576 K potassium 53.33333
## 577 K potassium 55
## 578 G potassium 35
## 579 G potassium 230
## 580 G potassium 110
## 581 G potassium 80
## 582 G potassium 25
## 583 R potassium 171.64179
## 584 G potassium 110
## 585 G potassium 80
```

```
## 586 N vitamins enriched
## 587 K vitamins enriched
## 588 K vitamins enriched
## 589 G vitamins enriched
## 590 K vitamins enriched
## 591 G vitamins enriched
## 592 R vitamins enriched
## 593 P vitamins enriched
## 594 Q vitamins enriched
## 595 G vitamins enriched
## 596 G vitamins enriched
## 597 G vitamins enriched
## 598 G vitamins enriched
## 599 R vitamins enriched
## 600 K vitamins enriched
## 601 K vitamins enriched
## 602 G vitamins enriched
## 603 K vitamins enriched
## 604 K vitamins enriched
## 605 G vitamins enriched
## 606 R vitamins enriched
## 607 K vitamins enriched
## 608 K vitamins enriched
## 609 K vitamins enriched
## 610 P vitamins enriched
## 611 K vitamins enriched
## 612 P vitamins enriched
## 613 P vitamins enriched
## 614 G vitamins enriched
## 615 P vitamins enriched
## 616 P vitamins enriched
## 617 P vitamins enriched
## 618 Q vitamins enriched
## 619 G vitamins enriched
## 620 P vitamins enriched
## 621 K vitamins 100%
## 622 G vitamins enriched
## 623 Q vitamins enriched
## 624 G vitamins enriched
## 625 K vitamins enriched
## 626 G vitamins enriched
## 627 K vitamins enriched
## 628 K vitamins enriched
## 629 G vitamins enriched
## 630 P vitamins enriched
## 631 K vitamins 100%
## 632 Q vitamins none
## 633 Q vitamins enriched
## 634 K vitamins enriched
## 635 G vitamins enriched
## 636 K vitamins enriched
## 637 R vitamins enriched
## 638 K vitamins enriched
## 639 N vitamins none
```

```
## 640 N vitamins none
## 641 K vitamins enriched
## 642 K vitamins enriched
## 643 G vitamins 100%
## 644 G vitamins 100%
## 645 G vitamins 100%
## 646 G vitamins enriched
## 647 G vitamins enriched
## 648 R vitamins enriched
## 649 G vitamins enriched
## 650 G vitamins enriched
```

Remove missing values in your dataset.

```
library(ggplot2)
remove_missing(UScereal1, na.rm = FALSE, vars = names(UScereal1), name = "", finite = FALSE)
```

```
## mfr calories protein fat
## 100% Bran N 212.12121 12.1212121 3.0303030
## All-Bran K 212.12121 12.1212121 3.0303030
## All-Bran with Extra Fiber K 100.00000 8.0000000 0.0000000
## Apple Cinnamon Cheerios G 146.66667 2.6666667 2.6666667
## Apple Jacks K 110.00000 2.0000000 0.0000000
## Basic 4 G 173.33333 4.0000000 2.6666667
## Bran Chex R 134.32836 2.9850746 1.4925373
## Bran Flakes P 134.32836 4.4776119 0.0000000
## Cap'n'Crunch Q 160.00000 1.3333333 2.6666667
## Cheerios G 88.00000 4.8000000 1.6000000
## Cinnamon Toast Crunch G 160.00000 1.3333333 4.0000000
## Clusters G 220.00000 6.0000000 4.0000000
## Cocoa Puffs G 110.00000 1.0000000 1.0000000
## Corn Chex R 110.00000 2.0000000 0.0000000
## Corn Flakes K 100.00000 2.0000000 0.0000000
## Corn Pops K 110.00000 1.0000000 0.0000000
## Count Chocula G 110.00000 1.0000000 1.0000000
## Cracklin' Oat Bran K 220.00000 6.0000000 6.0000000
## Crispix K 110.00000 2.0000000 0.0000000
## Crispy Wheat & Raisins G 133.33333 2.6666667 1.3333333
## Double Chex R 133.33333 2.6666667 0.0000000
## Froot Loops K 110.00000 2.0000000 1.0000000
## Frosted Flakes K 146.66667 1.3333333 0.0000000
## Frosted Mini-Wheats K 125.00000 3.7500000 0.0000000
## Fruit & Fibre: Dates Walnuts and Oats P 179.10448 4.4776119 2.9850746
## Fruitful Bran K 179.10448 4.4776119 0.0000000
## Fruity Pebbles P 146.66667 1.3333333 1.3333333
## Golden Crisp P 113.63636 2.2727273 0.0000000
## Golden Grahams G 146.66667 1.3333333 1.3333333
## Grape Nuts Flakes P 113.63636 3.4090909 1.1363636
## Grape-Nuts P 440.00000 12.0000000 0.0000000
## Great Grains Pecan P 363.63636 9.0909091 9.0909091
## Honey Graham Ohs Q 120.00000 1.0000000 2.0000000
## Honey Nut Cheerios G 146.66667 4.0000000 1.3333333
## Honey-comb P 82.70677 0.7518797 0.0000000
## Just Right Fruit & Nut K 186.66667 4.0000000 1.3333333
## Kix G 73.33333 1.3333333 0.6666667
```

## Life	Q	149.25373	5.9701493	2.9850746	
## Lucky Charms	G	110.00000	2.0000000	1.0000000	
## Mueslix Crispy Blend	K	238.80597	4.4776119	2.9850746	
## Multi-Grain Cheerios	G	100.00000	2.0000000	1.0000000	
## Nut&Honey Crunch	K	179.10448	2.9850746	1.4925373	
## Nutri-Grain Almond-Raisin	K	208.95522	4.4776119	2.9850746	
## Oatmeal Raisin Crisp	G	260.00000	6.0000000	4.0000000	
## Post Nat. Raisin Bran	P	179.10448	4.4776119	1.4925373	
## Product 19	K	100.00000	3.0000000	0.0000000	
## Puffed Rice	Q	50.00000	1.0000000	0.0000000	
## Quaker Oat Squares	Q	200.00000	8.0000000	2.0000000	
## Raisin Bran	K	160.00000	4.0000000	1.3333333	
## Raisin Nut Bran	G	200.00000	6.0000000	4.0000000	
## Raisin Squares	K	180.00000	4.0000000	0.0000000	
## Rice Chex	R	97.34513	0.8849558	0.0000000	
## Rice Krispies	K	110.00000	2.0000000	0.0000000	
## Shredded Wheat 'n'Bran	N	134.32836	4.4776119	0.0000000	
## Shredded Wheat spoon size	N	134.32836	4.4776119	0.0000000	
## Smacks	K	146.66667	2.6666667	1.3333333	
## Special K	K	110.00000	6.0000000	0.0000000	
## Total Corn Flakes	G	110.00000	2.0000000	1.0000000	
## Total Raisin Bran	G	140.00000	3.0000000	1.0000000	
## Total Whole Grain	G	100.00000	3.0000000	1.0000000	
## Triples	G	146.66667	2.6666667	1.3333333	
## Trix	G	110.00000	1.0000000	1.0000000	
## Wheat Chex	R	149.25373	4.4776119	1.4925373	
## Wheaties	G	100.00000	3.0000000	1.0000000	
## Wheaties Honey Gold	G	146.66667	2.6666667	1.3333333	
##		sodium	fibre	carbo	sugars
## 100% Bran		393.93939	30.303030	15.15152	18.181818
## All-Bran		787.87879	27.272727	21.21212	15.151515
## All-Bran with Extra Fiber		280.00000	28.000000	16.00000	0.000000
## Apple Cinnamon Cheerios		240.00000	2.000000	14.00000	13.333333
## Apple Jacks		125.00000	1.000000	11.00000	14.000000
## Basic 4		280.00000	2.666667	24.00000	10.666667
## Bran Chex		298.50746	5.970149	22.38806	8.955224
## Bran Flakes		313.43284	7.462687	19.40299	7.462687
## Cap'n'Crunch		293.33333	0.000000	16.00000	16.000000
## Cheerios		232.00000	1.600000	13.60000	0.800000
## Cinnamon Toast Crunch		280.00000	0.000000	17.33333	12.000000
## Clusters		280.00000	4.000000	26.00000	14.000000
## Cocoa Puffs		180.00000	0.000000	12.00000	13.000000
## Corn Chex		280.00000	0.000000	22.00000	3.000000
## Corn Flakes		290.00000	1.000000	21.00000	2.000000
## Corn Pops		90.00000	1.000000	13.00000	12.000000
## Count Chocula		180.00000	0.000000	12.00000	13.000000
## Cracklin' Oat Bran		280.00000	8.000000	20.00000	14.000000
## Crispix		220.00000	1.000000	21.00000	3.000000
## Crispy Wheat & Raisins		186.66667	2.666667	14.66667	13.333333
## Double Chex		253.33333	1.333333	24.00000	6.666667
## Froot Loops		125.00000	1.000000	11.00000	13.000000
## Frosted Flakes		266.66667	1.333333	18.66667	14.666667
## Frosted Mini-Wheats		0.00000	3.750000	17.50000	8.750000
## Fruit & Fibre: Dates Walnuts and Oats		238.80597	7.462687	17.91045	14.925373

## Fruitful Bran	358.20896	7.462687	20.89552	17.910448
## Fruity Pebbles	180.00000	0.000000	17.33333	16.000000
## Golden Crisp	51.13636	0.000000	12.50000	17.045455
## Golden Grahams	373.33333	0.000000	20.00000	12.000000
## Grape Nuts Flakes	159.09091	3.409091	17.04545	5.681818
## Grape-Nuts	680.00000	12.000000	68.00000	12.000000
## Great Grains Pecan	227.27273	9.090909	39.39394	12.121212
## Honey Graham Ohs	220.00000	1.000000	12.00000	11.000000
## Honey Nut Cheerios	333.33333	2.000000	15.33333	13.333333
## Honey-comb	135.33835	0.000000	10.52632	8.270677
## Just Right Fruit & Nut	226.66667	2.666667	26.66667	12.000000
## Kix	173.33333	0.000000	14.00000	2.000000
## Life	223.88060	2.985075	17.91045	8.955224
## Lucky Charms	180.00000	0.000000	12.00000	12.000000
## Mueslix Crispy Blend	223.88060	4.477612	25.37313	19.402985
## Multi-Grain Cheerios	220.00000	2.000000	15.00000	6.000000
## Nut&Honey Crunch	283.58209	0.000000	22.38806	13.432836
## Nutri-Grain Almond-Raisin	328.35821	4.477612	31.34328	10.447761
## Oatmeal Raisin Crisp	340.00000	3.000000	27.00000	20.000000
## Post Nat. Raisin Bran	298.50746	8.955224	16.41791	20.895522
## Product 19	320.00000	1.000000	20.00000	3.000000
## Puffed Rice	0.00000	0.000000	13.00000	0.000000
## Quaker Oat Squares	270.00000	4.000000	28.00000	12.000000
## Raisin Bran	280.00000	6.666667	18.66667	16.000000
## Raisin Nut Bran	280.00000	5.000000	21.00000	16.000000
## Raisin Squares	0.00000	4.000000	30.00000	12.000000
## Rice Chex	212.38938	0.000000	20.35398	1.769912
## Rice Krispies	290.00000	0.000000	22.00000	3.000000
## Shredded Wheat 'n'Bran	0.00000	5.970149	28.35821	0.000000
## Shredded Wheat spoon size	0.00000	4.477612	29.85075	0.000000
## Smacks	93.33333	1.333333	12.00000	20.000000
## Special K	230.00000	1.000000	16.00000	3.000000
## Total Corn Flakes	200.00000	0.000000	21.00000	3.000000
## Total Raisin Bran	190.00000	4.000000	15.00000	14.000000
## Total Whole Grain	200.00000	3.000000	16.00000	3.000000
## Triples	333.33333	0.000000	28.00000	4.000000
## Trix	140.00000	0.000000	13.00000	12.000000
## Wheat Chex	343.28358	4.477612	25.37313	4.477612
## Wheaties	200.00000	3.000000	17.00000	3.000000
## Wheaties Honey Gold	266.66667	1.333333	21.33333	10.666667
##	shelf	potassium	vitamins	
## 100% Bran	3	848.48485	enriched	
## All-Bran	3	969.69697	enriched	
## All-Bran with Extra Fiber	3	660.00000	enriched	
## Apple Cinnamon Cheerios	1	93.33333	enriched	
## Apple Jacks	2	30.00000	enriched	
## Basic 4	3	133.33333	enriched	
## Bran Chex	1	186.56716	enriched	
## Bran Flakes	3	283.58209	enriched	
## Cap'n'Crunch	2	46.66667	enriched	
## Cheerios	1	84.00000	enriched	
## Cinnamon Toast Crunch	2	60.00000	enriched	
## Clusters	3	210.00000	enriched	
## Cocoa Puffs	2	55.00000	enriched	

## Corn Chex	1	25.00000	enriched
## Corn Flakes	1	35.00000	enriched
## Corn Pops	2	20.00000	enriched
## Count Chocula	2	65.00000	enriched
## Cracklin' Oat Bran	3	320.00000	enriched
## Crispix	3	30.00000	enriched
## Crispy Wheat & Raisins	3	160.00000	enriched
## Double Chex	3	106.66667	enriched
## Froot Loops	2	30.00000	enriched
## Frosted Flakes	1	33.33333	enriched
## Frosted Mini-Wheats	2	125.00000	enriched
## Fruit & Fibre: Dates Walnuts and Oats	3	298.50746	enriched
## Fruitful Bran	3	283.58209	enriched
## Fruity Pebbles	2	33.33333	enriched
## Golden Crisp	1	45.45455	enriched
## Golden Grahams	2	60.00000	enriched
## Grape Nuts Flakes	3	96.59091	enriched
## Grape-Nuts	3	360.00000	enriched
## Great Grains Pecan	3	303.03030	enriched
## Honey Graham Ohs	2	45.00000	enriched
## Honey Nut Cheerios	1	120.00000	enriched
## Honey-comb	1	26.31579	enriched
## Just Right Fruit & Nut	3	126.66667	100%
## Kix	2	26.66667	enriched
## Life	2	141.79104	enriched
## Lucky Charms	2	55.00000	enriched
## Mueslix Crispy Blend	3	238.80597	enriched
## Multi-Grain Cheerios	1	90.00000	enriched
## Nut&Honey Crunch	2	59.70149	enriched
## Nutri-Grain Almond-Raisin	3	194.02985	enriched
## Oatmeal Raisin Crisp	3	240.00000	enriched
## Post Nat. Raisin Bran	3	388.05970	enriched
## Product 19	3	45.00000	100%
## Puffed Rice	3	15.00000	none
## Quaker Oat Squares	3	220.00000	enriched
## Raisin Bran	2	320.00000	enriched
## Raisin Nut Bran	3	280.00000	enriched
## Raisin Squares	3	220.00000	enriched
## Rice Chex	1	26.54867	enriched
## Rice Krispies	1	35.00000	enriched
## Shredded Wheat 'n'Bran	1	208.95522	none
## Shredded Wheat spoon size	1	179.10448	none
## Smacks	2	53.33333	enriched
## Special K	1	55.00000	enriched
## Total Corn Flakes	3	35.00000	100%
## Total Raisin Bran	3	230.00000	100%
## Total Whole Grain	3	110.00000	100%
## Triples	3	80.00000	enriched
## Trix	2	25.00000	enriched
## Wheat Chex	1	171.64179	enriched
## Wheaties	1	110.00000	enriched
## Wheaties Honey Gold	1	80.00000	enriched

Identify and remove duplicated data in your dataset

```
UScereal1[!duplicated(UScereal1), ]
```

	mfr	calories	protein	fat
## 100% Bran	N	212.12121	12.1212121	3.0303030
## All-Bran	K	212.12121	12.1212121	3.0303030
## All-Bran with Extra Fiber	K	100.00000	8.0000000	0.0000000
## Apple Cinnamon Cheerios	G	146.66667	2.6666667	2.6666667
## Apple Jacks	K	110.00000	2.0000000	0.0000000
## Basic 4	G	173.33333	4.0000000	2.6666667
## Bran Chex	R	134.32836	2.9850746	1.4925373
## Bran Flakes	P	134.32836	4.4776119	0.0000000
## Cap'n'Crunch	Q	160.00000	1.3333333	2.6666667
## Cheerios	G	88.00000	4.8000000	1.6000000
## Cinnamon Toast Crunch	G	160.00000	1.3333333	4.0000000
## Clusters	G	220.00000	6.0000000	4.0000000
## Cocoa Puffs	G	110.00000	1.0000000	1.0000000
## Corn Chex	R	110.00000	2.0000000	0.0000000
## Corn Flakes	K	100.00000	2.0000000	0.0000000
## Corn Pops	K	110.00000	1.0000000	0.0000000
## Count Chocula	G	110.00000	1.0000000	1.0000000
## Cracklin' Oat Bran	K	220.00000	6.0000000	6.0000000
## Crispix	K	110.00000	2.0000000	0.0000000
## Crispy Wheat & Raisins	G	133.33333	2.6666667	1.3333333
## Double Chex	R	133.33333	2.6666667	0.0000000
## Froot Loops	K	110.00000	2.0000000	1.0000000
## Frosted Flakes	K	146.66667	1.3333333	0.0000000
## Frosted Mini-Wheats	K	125.00000	3.7500000	0.0000000
## Fruit & Fibre: Dates Walnuts and Oats	P	179.10448	4.4776119	2.9850746
## Fruitful Bran	K	179.10448	4.4776119	0.0000000
## Fruity Pebbles	P	146.66667	1.3333333	1.3333333
## Golden Crisp	P	113.63636	2.2727273	0.0000000
## Golden Grahams	G	146.66667	1.3333333	1.3333333
## Grape Nuts Flakes	P	113.63636	3.4090909	1.1363636
## Grape-Nuts	P	440.00000	12.0000000	0.0000000
## Great Grains Pecan	P	363.63636	9.0909091	9.0909091
## Honey Graham Ohs	Q	120.00000	1.0000000	2.0000000
## Honey Nut Cheerios	G	146.66667	4.0000000	1.3333333
## Honey-comb	P	82.70677	0.7518797	0.0000000
## Just Right Fruit & Nut	K	186.66667	4.0000000	1.3333333
## Kix	G	73.33333	1.3333333	0.6666667
## Life	Q	149.25373	5.9701493	2.9850746
## Lucky Charms	G	110.00000	2.0000000	1.0000000
## Mueslix Crispy Blend	K	238.80597	4.4776119	2.9850746
## Multi-Grain Cheerios	G	100.00000	2.0000000	1.0000000
## Nut&Honey Crunch	K	179.10448	2.9850746	1.4925373
## Nutri-Grain Almond-Raisin	K	208.95522	4.4776119	2.9850746
## Oatmeal Raisin Crisp	G	260.00000	6.0000000	4.0000000
## Post Nat. Raisin Bran	P	179.10448	4.4776119	1.4925373
## Product 19	K	100.00000	3.0000000	0.0000000
## Puffed Rice	Q	50.00000	1.0000000	0.0000000
## Quaker Oat Squares	Q	200.00000	8.0000000	2.0000000
## Raisin Bran	K	160.00000	4.0000000	1.3333333
## Raisin Nut Bran	G	200.00000	6.0000000	4.0000000
## Raisin Squares	K	180.00000	4.0000000	0.0000000

## Rice Chex	R	97.34513	0.8849558	0.0000000
## Rice Krispies	K	110.00000	2.0000000	0.0000000
## Shredded Wheat 'n'Bran	N	134.32836	4.4776119	0.0000000
## Shredded Wheat spoon size	N	134.32836	4.4776119	0.0000000
## Smacks	K	146.66667	2.6666667	1.3333333
## Special K	K	110.00000	6.0000000	0.0000000
## Total Corn Flakes	G	110.00000	2.0000000	1.0000000
## Total Raisin Bran	G	140.00000	3.0000000	1.0000000
## Total Whole Grain	G	100.00000	3.0000000	1.0000000
## Triples	G	146.66667	2.6666667	1.3333333
## Trix	G	110.00000	1.0000000	1.0000000
## Wheat Chex	R	149.25373	4.4776119	1.4925373
## Wheaties	G	100.00000	3.0000000	1.0000000
## Wheaties Honey Gold	G	146.66667	2.6666667	1.3333333
##		sodium	fibre	carbo
## 100% Bran		393.93939	30.303030	15.15152
## All-Bran		787.87879	27.272727	21.21212
## All-Bran with Extra Fiber		280.00000	28.000000	16.00000
## Apple Cinnamon Cheerios		240.00000	2.000000	14.00000
## Apple Jacks		125.00000	1.000000	11.00000
## Basic 4		280.00000	2.666667	24.00000
## Bran Chex		298.50746	5.970149	22.38806
## Bran Flakes		313.43284	7.462687	19.40299
## Cap'n'Crunch		293.33333	0.000000	16.00000
## Cheerios		232.00000	1.600000	13.60000
## Cinnamon Toast Crunch		280.00000	0.000000	17.33333
## Clusters		280.00000	4.000000	26.00000
## Cocoa Puffs		180.00000	0.000000	12.00000
## Corn Chex		280.00000	0.000000	22.00000
## Corn Flakes		290.00000	1.000000	21.00000
## Corn Pops		90.00000	1.000000	13.00000
## Count Chocula		180.00000	0.000000	12.00000
## Cracklin' Oat Bran		280.00000	8.000000	20.00000
## Crispix		220.00000	1.000000	21.00000
## Crispy Wheat & Raisins		186.66667	2.666667	14.66667
## Double Chex		253.33333	1.333333	24.00000
## Froot Loops		125.00000	1.000000	11.00000
## Frosted Flakes		266.66667	1.333333	18.66667
## Frosted Mini-Wheats		0.00000	3.750000	17.50000
## Fruit & Fibre: Dates Walnuts and Oats		238.80597	7.462687	17.91045
## Fruitful Bran		358.20896	7.462687	20.89552
## Fruity Pebbles		180.00000	0.000000	17.33333
## Golden Crisp		51.13636	0.000000	12.50000
## Golden Grahams		373.33333	0.000000	20.00000
## Grape Nuts Flakes		159.09091	3.409091	17.04545
## Grape-Nuts		680.00000	12.000000	68.00000
## Great Grains Pecan		227.27273	9.090909	39.39394
## Honey Graham Ohs		220.00000	1.000000	12.00000
## Honey Nut Cheerios		333.33333	2.000000	15.33333
## Honey-comb		135.33835	0.000000	10.52632
## Just Right Fruit & Nut		226.66667	2.666667	26.66667
## Kix		173.33333	0.000000	14.00000
## Life		223.88060	2.985075	17.91045
## Lucky Charms		180.00000	0.000000	12.00000

## Mueslix Crispy Blend	223.88060	4.477612	25.37313	19.402985
## Multi-Grain Cheerios	220.00000	2.000000	15.00000	6.000000
## Nut&Honey Crunch	283.58209	0.000000	22.38806	13.432836
## Nutri-Grain Almond-Raisin	328.35821	4.477612	31.34328	10.447761
## Oatmeal Raisin Crisp	340.00000	3.000000	27.00000	20.000000
## Post Nat. Raisin Bran	298.50746	8.955224	16.41791	20.895522
## Product 19	320.00000	1.000000	20.00000	3.000000
## Puffed Rice	0.00000	0.000000	13.00000	0.000000
## Quaker Oat Squares	270.00000	4.000000	28.00000	12.000000
## Raisin Bran	280.00000	6.666667	18.66667	16.000000
## Raisin Nut Bran	280.00000	5.000000	21.00000	16.000000
## Raisin Squares	0.00000	4.000000	30.00000	12.000000
## Rice Chex	212.38938	0.000000	20.35398	1.769912
## Rice Krispies	290.00000	0.000000	22.00000	3.000000
## Shredded Wheat 'n'Bran	0.00000	5.970149	28.35821	0.000000
## Shredded Wheat spoon size	0.00000	4.477612	29.85075	0.000000
## Smacks	93.33333	1.333333	12.00000	20.000000
## Special K	230.00000	1.000000	16.00000	3.000000
## Total Corn Flakes	200.00000	0.000000	21.00000	3.000000
## Total Raisin Bran	190.00000	4.000000	15.00000	14.000000
## Total Whole Grain	200.00000	3.000000	16.00000	3.000000
## Triples	333.33333	0.000000	28.00000	4.000000
## Trix	140.00000	0.000000	13.00000	12.000000
## Wheat Chex	343.28358	4.477612	25.37313	4.477612
## Wheaties	200.00000	3.000000	17.00000	3.000000
## Wheaties Honey Gold	266.66667	1.333333	21.33333	10.666667
##	shelf	potassium	vitamins	
## 100% Bran	3	848.48485	enriched	
## All-Bran	3	969.69697	enriched	
## All-Bran with Extra Fiber	3	660.00000	enriched	
## Apple Cinnamon Cheerios	1	93.33333	enriched	
## Apple Jacks	2	30.00000	enriched	
## Basic 4	3	133.33333	enriched	
## Bran Chex	1	186.56716	enriched	
## Bran Flakes	3	283.58209	enriched	
## Cap'n'Crunch	2	46.66667	enriched	
## Cheerios	1	84.00000	enriched	
## Cinnamon Toast Crunch	2	60.00000	enriched	
## Clusters	3	210.00000	enriched	
## Cocoa Puffs	2	55.00000	enriched	
## Corn Chex	1	25.00000	enriched	
## Corn Flakes	1	35.00000	enriched	
## Corn Pops	2	20.00000	enriched	
## Count Chocula	2	65.00000	enriched	
## Cracklin' Oat Bran	3	320.00000	enriched	
## Crispix	3	30.00000	enriched	
## Crispy Wheat & Raisins	3	160.00000	enriched	
## Double Chex	3	106.66667	enriched	
## Froot Loops	2	30.00000	enriched	
## Frosted Flakes	1	33.33333	enriched	
## Frosted Mini-Wheats	2	125.00000	enriched	
## Fruit & Fibre: Dates Walnuts and Oats	3	298.50746	enriched	
## Fruitful Bran	3	283.58209	enriched	
## Fruity Pebbles	2	33.33333	enriched	

```
## Golden Crisp      1  45.45455 enriched
## Golden Grahams    2  60.00000 enriched
## Grape Nuts Flakes 3  96.59091 enriched
## Grape-Nuts        3 360.00000 enriched
## Great Grains Pecan 3 303.03030 enriched
## Honey Graham Ohs   2  45.00000 enriched
## Honey Nut Cheerios 1 120.00000 enriched
## Honey-comb         1  26.31579 enriched
## Just Right Fruit & Nut 3 126.66667 100%
## Kix                2  26.66667 enriched
## Life              2 141.79104 enriched
## Lucky Charms       2  55.00000 enriched
## MuesliX Crispy Blend 3 238.80597 enriched
## Multi-Grain Cheerios 1  90.00000 enriched
## Nut&Honey Crunch   2  59.70149 enriched
## Nutri-Grain Almond-Raisin 3 194.02985 enriched
## Oatmeal Raisin Crisp 3 240.00000 enriched
## Post Nat. Raisin Bran 3 388.05970 enriched
## Product 19         3  45.00000 100%
## Puffed Rice        3  15.00000 none
## Quaker Oat Squares 3 220.00000 enriched
## Raisin Bran        2 320.00000 enriched
## Raisin Nut Bran     3 280.00000 enriched
## Raisin Squares     3 220.00000 enriched
## Rice Chex          1  26.54867 enriched
## Rice Krispies      1  35.00000 enriched
## Shredded Wheat 'n'Bran 1 208.95522 none
## Shredded Wheat spoon size 1 179.10448 none
## Smacks             2  53.33333 enriched
## Special K          1  55.00000 enriched
## Total Corn Flakes   3  35.00000 100%
## Total Raisin Bran   3 230.00000 100%
## Total Whole Grain   3 110.00000 100%
## Triples            3  80.00000 enriched
## Trix               2  25.00000 enriched
## Wheat Chex         1 171.64179 enriched
## Wheaties           1 110.00000 enriched
## Wheaties Honey Gold 1  80.00000 enriched
```

Reorder multiple rows in descending order

```
library(dplyr)
```

```
##
## Attaching package: 'dplyr'

## The following object is masked from 'package:MASS':
##
##   select

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

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

```
UScereal1 %>% arrange(mfr, shelf)
```

	mfr	calories	protein	fat
##				
## Apple Cinnamon Cheerios	G	146.66667	2.6666667	2.6666667
## Cheerios	G	88.00000	4.8000000	1.6000000
## Honey Nut Cheerios	G	146.66667	4.0000000	1.3333333
## Multi-Grain Cheerios	G	100.00000	2.0000000	1.0000000
## Wheaties	G	100.00000	3.0000000	1.0000000
## Wheaties Honey Gold	G	146.66667	2.6666667	1.3333333
## Cinnamon Toast Crunch	G	160.00000	1.3333333	4.0000000
## Cocoa Puffs	G	110.00000	1.0000000	1.0000000
## Count Chocula	G	110.00000	1.0000000	1.0000000
## Golden Grahams	G	146.66667	1.3333333	1.3333333
## Kix	G	73.33333	1.3333333	0.6666667
## Lucky Charms	G	110.00000	2.0000000	1.0000000
## Trix	G	110.00000	1.0000000	1.0000000
## Basic 4	G	173.33333	4.0000000	2.6666667
## Clusters	G	220.00000	6.0000000	4.0000000
## Crispy Wheat & Raisins	G	133.33333	2.6666667	1.3333333
## Oatmeal Raisin Crisp	G	260.00000	6.0000000	4.0000000
## Raisin Nut Bran	G	200.00000	6.0000000	4.0000000
## Total Corn Flakes	G	110.00000	2.0000000	1.0000000
## Total Raisin Bran	G	140.00000	3.0000000	1.0000000
## Total Whole Grain	G	100.00000	3.0000000	1.0000000
## Triples	G	146.66667	2.6666667	1.3333333
## Corn Flakes	K	100.00000	2.0000000	0.0000000
## Frosted Flakes	K	146.66667	1.3333333	0.0000000
## Rice Krispies	K	110.00000	2.0000000	0.0000000
## Special K	K	110.00000	6.0000000	0.0000000
## Apple Jacks	K	110.00000	2.0000000	0.0000000
## Corn Pops	K	110.00000	1.0000000	0.0000000
## Froot Loops	K	110.00000	2.0000000	1.0000000
## Frosted Mini-Wheats	K	125.00000	3.7500000	0.0000000
## Nut&Honey Crunch	K	179.10448	2.9850746	1.4925373
## Raisin Bran	K	160.00000	4.0000000	1.3333333
## Smacks	K	146.66667	2.6666667	1.3333333
## All-Bran	K	212.12121	12.1212121	3.0303030
## All-Bran with Extra Fiber	K	100.00000	8.0000000	0.0000000
## Cracklin' Oat Bran	K	220.00000	6.0000000	6.0000000
## Crispix	K	110.00000	2.0000000	0.0000000
## Fruitful Bran	K	179.10448	4.4776119	0.0000000
## Just Right Fruit & Nut	K	186.66667	4.0000000	1.3333333
## Mueslix Crispy Blend	K	238.80597	4.4776119	2.9850746
## Nutri-Grain Almond-Raisin	K	208.95522	4.4776119	2.9850746
## Product 19	K	100.00000	3.0000000	0.0000000
## Raisin Squares	K	180.00000	4.0000000	0.0000000
## Shredded Wheat 'n'Bran	N	134.32836	4.4776119	0.0000000
## Shredded Wheat spoon size	N	134.32836	4.4776119	0.0000000
## 100% Bran	N	212.12121	12.1212121	3.0303030
## Golden Crisp	P	113.63636	2.2727273	0.0000000
## Honey-comb	P	82.70677	0.7518797	0.0000000
## Fruity Pebbles	P	146.66667	1.3333333	1.3333333
## Bran Flakes	P	134.32836	4.4776119	0.0000000
## Fruit & Fibre: Dates Walnuts and Oats	P	179.10448	4.4776119	2.9850746

## Grape Nuts Flakes	P	113.63636	3.4090909	1.1363636	
## Grape-Nuts	P	440.00000	12.0000000	0.0000000	
## Great Grains Pecan	P	363.63636	9.0909091	9.0909091	
## Post Nat. Raisin Bran	P	179.10448	4.4776119	1.4925373	
## Cap'n'Crunch	Q	160.00000	1.3333333	2.6666667	
## Honey Graham Ohs	Q	120.00000	1.0000000	2.0000000	
## Life	Q	149.25373	5.9701493	2.9850746	
## Puffed Rice	Q	50.00000	1.0000000	0.0000000	
## Quaker Oat Squares	Q	200.00000	8.0000000	2.0000000	
## Bran Chex	R	134.32836	2.9850746	1.4925373	
## Corn Chex	R	110.00000	2.0000000	0.0000000	
## Rice Chex	R	97.34513	0.8849558	0.0000000	
## Wheat Chex	R	149.25373	4.4776119	1.4925373	
## Double Chex	R	133.33333	2.6666667	0.0000000	
##		sodium	fibre	carbo	sugars
## Apple Cinnamon Cheerios		240.00000	2.000000	14.00000	13.333333
## Cheerios		232.00000	1.600000	13.60000	0.800000
## Honey Nut Cheerios		333.33333	2.000000	15.33333	13.333333
## Multi-Grain Cheerios		220.00000	2.000000	15.00000	6.000000
## Wheaties		200.00000	3.000000	17.00000	3.000000
## Wheaties Honey Gold		266.66667	1.333333	21.33333	10.666667
## Cinnamon Toast Crunch		280.00000	0.000000	17.33333	12.000000
## Cocoa Puffs		180.00000	0.000000	12.00000	13.000000
## Count Chocula		180.00000	0.000000	12.00000	13.000000
## Golden Grahams		373.33333	0.000000	20.00000	12.000000
## Kix		173.33333	0.000000	14.00000	2.000000
## Lucky Charms		180.00000	0.000000	12.00000	12.000000
## Trix		140.00000	0.000000	13.00000	12.000000
## Basic 4		280.00000	2.666667	24.00000	10.666667
## Clusters		280.00000	4.000000	26.00000	14.000000
## Crispy Wheat & Raisins		186.66667	2.666667	14.66667	13.333333
## Oatmeal Raisin Crisp		340.00000	3.000000	27.00000	20.000000
## Raisin Nut Bran		280.00000	5.000000	21.00000	16.000000
## Total Corn Flakes		200.00000	0.000000	21.00000	3.000000
## Total Raisin Bran		190.00000	4.000000	15.00000	14.000000
## Total Whole Grain		200.00000	3.000000	16.00000	3.000000
## Triples		333.33333	0.000000	28.00000	4.000000
## Corn Flakes		290.00000	1.000000	21.00000	2.000000
## Frosted Flakes		266.66667	1.333333	18.66667	14.666667
## Rice Krispies		290.00000	0.000000	22.00000	3.000000
## Special K		230.00000	1.000000	16.00000	3.000000
## Apple Jacks		125.00000	1.000000	11.00000	14.000000
## Corn Pops		90.00000	1.000000	13.00000	12.000000
## Froot Loops		125.00000	1.000000	11.00000	13.000000
## Frosted Mini-Wheats		0.00000	3.750000	17.50000	8.750000
## Nut&Honey Crunch		283.58209	0.000000	22.38806	13.432836
## Raisin Bran		280.00000	6.666667	18.66667	16.000000
## Smacks		93.33333	1.333333	12.00000	20.000000
## All-Bran		787.87879	27.272727	21.21212	15.151515
## All-Bran with Extra Fiber		280.00000	28.000000	16.00000	0.000000
## Cracklin' Oat Bran		280.00000	8.000000	20.00000	14.000000
## Crispix		220.00000	1.000000	21.00000	3.000000
## Fruitful Bran		358.20896	7.462687	20.89552	17.910448
## Just Right Fruit & Nut		226.66667	2.666667	26.66667	12.000000

## Mueslix Crispy Blend	223.88060	4.477612	25.37313	19.402985
## Nutri-Grain Almond-Raisin	328.35821	4.477612	31.34328	10.447761
## Product 19	320.00000	1.000000	20.00000	3.000000
## Raisin Squares	0.00000	4.000000	30.00000	12.000000
## Shredded Wheat 'n'Bran	0.00000	5.970149	28.35821	0.000000
## Shredded Wheat spoon size	0.00000	4.477612	29.85075	0.000000
## 100% Bran	393.93939	30.303030	15.15152	18.181818
## Golden Crisp	51.13636	0.000000	12.50000	17.045455
## Honey-comb	135.33835	0.000000	10.52632	8.270677
## Fruity Pebbles	180.00000	0.000000	17.33333	16.000000
## Bran Flakes	313.43284	7.462687	19.40299	7.462687
## Fruit & Fibre: Dates Walnuts and Oats	238.80597	7.462687	17.91045	14.925373
## Grape Nuts Flakes	159.09091	3.409091	17.04545	5.681818
## Grape-Nuts	680.00000	12.000000	68.00000	12.000000
## Great Grains Pecan	227.27273	9.090909	39.39394	12.121212
## Post Nat. Raisin Bran	298.50746	8.955224	16.41791	20.895522
## Cap'n'Crunch	293.33333	0.000000	16.00000	16.000000
## Honey Graham Ohs	220.00000	1.000000	12.00000	11.000000
## Life	223.88060	2.985075	17.91045	8.955224
## Puffed Rice	0.00000	0.000000	13.00000	0.000000
## Quaker Oat Squares	270.00000	4.000000	28.00000	12.000000
## Bran Chex	298.50746	5.970149	22.38806	8.955224
## Corn Chex	280.00000	0.000000	22.00000	3.000000
## Rice Chex	212.38938	0.000000	20.35398	1.769912
## Wheat Chex	343.28358	4.477612	25.37313	4.477612
## Double Chex	253.33333	1.333333	24.00000	6.666667
##	shelf	potassium	vitamins	
## Apple Cinnamon Cheerios	1	93.33333	enriched	
## Cheerios	1	84.00000	enriched	
## Honey Nut Cheerios	1	120.00000	enriched	
## Multi-Grain Cheerios	1	90.00000	enriched	
## Wheaties	1	110.00000	enriched	
## Wheaties Honey Gold	1	80.00000	enriched	
## Cinnamon Toast Crunch	2	60.00000	enriched	
## Cocoa Puffs	2	55.00000	enriched	
## Count Chocula	2	65.00000	enriched	
## Golden Grahams	2	60.00000	enriched	
## Kix	2	26.66667	enriched	
## Lucky Charms	2	55.00000	enriched	
## Trix	2	25.00000	enriched	
## Basic 4	3	133.33333	enriched	
## Clusters	3	210.00000	enriched	
## Crispy Wheat & Raisins	3	160.00000	enriched	
## Oatmeal Raisin Crisp	3	240.00000	enriched	
## Raisin Nut Bran	3	280.00000	enriched	
## Total Corn Flakes	3	35.00000	100%	
## Total Raisin Bran	3	230.00000	100%	
## Total Whole Grain	3	110.00000	100%	
## Triples	3	80.00000	enriched	
## Corn Flakes	1	35.00000	enriched	
## Frosted Flakes	1	33.33333	enriched	
## Rice Krispies	1	35.00000	enriched	
## Special K	1	55.00000	enriched	
## Apple Jacks	2	30.00000	enriched	

```
## Corn Pops                2 20.00000 enriched
## Froot Loops              2 30.00000 enriched
## Frosted Mini-Wheats      2 125.00000 enriched
## Nut&Honey Crunch         2 59.70149 enriched
## Raisin Bran              2 320.00000 enriched
## Smacks                   2 53.33333 enriched
## All-Bran                 3 969.69697 enriched
## All-Bran with Extra Fiber 3 660.00000 enriched
## Cracklin' Oat Bran       3 320.00000 enriched
## Crispix                  3 30.00000 enriched
## Fruitful Bran            3 283.58209 enriched
## Just Right Fruit & Nut    3 126.66667 100%
## Mueslix Crispy Blend     3 238.80597 enriched
## Nutri-Grain Almond-Raisin 3 194.02985 enriched
## Product 19               3 45.00000 100%
## Raisin Squares           3 220.00000 enriched
## Shredded Wheat 'n'Bran    1 208.95522 none
## Shredded Wheat spoon size 1 179.10448 none
## 100% Bran                 3 848.48485 enriched
## Golden Crisp             1 45.45455 enriched
## Honey-comb               1 26.31579 enriched
## Fruity Pebbles           2 33.33333 enriched
## Bran Flakes              3 283.58209 enriched
## Fruit & Fibre: Dates Walnuts and Oats 3 298.50746 enriched
## Grape Nuts Flakes        3 96.59091 enriched
## Grape-Nuts               3 360.00000 enriched
## Great Grains Pecan       3 303.03030 enriched
## Post Nat. Raisin Bran    3 388.05970 enriched
## Cap'n'Crunch             2 46.66667 enriched
## Honey Graham Ohs         2 45.00000 enriched
## Life                     2 141.79104 enriched
## Puffed Rice              3 15.00000 none
## Quaker Oat Squares       3 220.00000 enriched
## Bran Chex                1 186.56716 enriched
## Corn Chex                1 25.00000 enriched
## Rice Chex                1 26.54867 enriched
## Wheat Chex               1 171.64179 enriched
## Double Chex              3 106.66667 enriched
```

Rename some of the column names in your dataset

```
names(UScereal1)[names(UScereal1)=="calories"] <- "calorie_content"
names(UScereal1)[names(UScereal1)=="mfr"] <- "Manufacturer"
head(UScereal1)
```

```
##           Manufacturer calorie_content  protein    fat
## 100% Bran           N         212.1212 12.121212 3.030303
## All-Bran           K         212.1212 12.121212 3.030303
## All-Bran with Extra Fiber K         100.0000 8.000000 0.000000
## Apple Cinnamon Cheerios G         146.6667 2.666667 2.666667
## Apple Jacks        K         110.0000 2.000000 0.000000
## Basic 4            G         173.3333 4.000000 2.666667
##           sodium    fibre    carbo    sugars shelf potassium
## 100% Bran    393.9394 30.303030 15.15152 18.18182      3 848.48485
## All-Bran     787.8788 27.272727 21.21212 15.15151      3 969.69697
```

```
## All-Bran with Extra Fiber 280.0000 28.000000 16.00000 0.00000 3 660.00000
## Apple Cinnamon Cheerios 240.0000 2.000000 14.00000 13.33333 1 93.33333
## Apple Jacks 125.0000 1.000000 11.00000 14.00000 2 30.00000
## Basic 4 280.0000 2.666667 24.00000 10.66667 3 133.33333
## vitamins
## 100% Bran enriched
## All-Bran enriched
## All-Bran with Extra Fiber enriched
## Apple Cinnamon Cheerios enriched
## Apple Jacks enriched
## Basic 4 enriched
```

Add new variables in your data frame by using a mathematical function (for e.g. – multiply an existing column by 2 and add it as a new variable to your data frame)

```
#Finding Kilocalories
UScereal1 %>%
  mutate(Kilocalories = calorie_content/1000)
```

```
## Manufacturer calorie_content protein
## 100% Bran N 212.12121 12.1212121
## All-Bran K 212.12121 12.1212121
## All-Bran with Extra Fiber K 100.00000 8.0000000
## Apple Cinnamon Cheerios G 146.66667 2.6666667
## Apple Jacks K 110.00000 2.0000000
## Basic 4 G 173.33333 4.0000000
## Bran Chex R 134.32836 2.9850746
## Bran Flakes P 134.32836 4.4776119
## Cap'n'Crunch Q 160.00000 1.3333333
## Cheerios G 88.00000 4.8000000
## Cinnamon Toast Crunch G 160.00000 1.3333333
## Clusters G 220.00000 6.0000000
## Cocoa Puffs G 110.00000 1.0000000
## Corn Chex R 110.00000 2.0000000
## Corn Flakes K 100.00000 2.0000000
## Corn Pops K 110.00000 1.0000000
## Count Chocula G 110.00000 1.0000000
## Cracklin' Oat Bran K 220.00000 6.0000000
## Crispix K 110.00000 2.0000000
## Crispy Wheat & Raisins G 133.33333 2.6666667
## Double Chex R 133.33333 2.6666667
## Froot Loops K 110.00000 2.0000000
## Frosted Flakes K 146.66667 1.3333333
## Frosted Mini-Wheats K 125.00000 3.7500000
## Fruit & Fibre: Dates Walnuts and Oats P 179.10448 4.4776119
## Fruitful Bran K 179.10448 4.4776119
## Fruity Pebbles P 146.66667 1.3333333
## Golden Crisp P 113.63636 2.2727273
## Golden Grahams G 146.66667 1.3333333
## Grape Nuts Flakes P 113.63636 3.4090909
## Grape-Nuts P 440.00000 12.0000000
## Great Grains Pecan P 363.63636 9.0909091
## Honey Graham Ohs Q 120.00000 1.0000000
## Honey Nut Cheerios G 146.66667 4.0000000
## Honey-comb P 82.70677 0.7518797
```

## Just Right Fruit & Nut	K	186.66667	4.0000000	
## Kix	G	73.33333	1.3333333	
## Life	Q	149.25373	5.9701493	
## Lucky Charms	G	110.00000	2.0000000	
## Mueslix Crispy Blend	K	238.80597	4.4776119	
## Multi-Grain Cheerios	G	100.00000	2.0000000	
## Nut&Honey Crunch	K	179.10448	2.9850746	
## Nutri-Grain Almond-Raisin	K	208.95522	4.4776119	
## Oatmeal Raisin Crisp	G	260.00000	6.0000000	
## Post Nat. Raisin Bran	P	179.10448	4.4776119	
## Product 19	K	100.00000	3.0000000	
## Puffed Rice	Q	50.00000	1.0000000	
## Quaker Oat Squares	Q	200.00000	8.0000000	
## Raisin Bran	K	160.00000	4.0000000	
## Raisin Nut Bran	G	200.00000	6.0000000	
## Raisin Squares	K	180.00000	4.0000000	
## Rice Chex	R	97.34513	0.8849558	
## Rice Krispies	K	110.00000	2.0000000	
## Shredded Wheat 'n'Bran	N	134.32836	4.4776119	
## Shredded Wheat spoon size	N	134.32836	4.4776119	
## Smacks	K	146.66667	2.6666667	
## Special K	K	110.00000	6.0000000	
## Total Corn Flakes	G	110.00000	2.0000000	
## Total Raisin Bran	G	140.00000	3.0000000	
## Total Whole Grain	G	100.00000	3.0000000	
## Triples	G	146.66667	2.6666667	
## Trix	G	110.00000	1.0000000	
## Wheat Chex	R	149.25373	4.4776119	
## Wheaties	G	100.00000	3.0000000	
## Wheaties Honey Gold	G	146.66667	2.6666667	
##				
	fat	sodium	fibre	carbo
## 100% Bran	3.0303030	393.93939	30.303030	15.15152
## All-Bran	3.0303030	787.87879	27.272727	21.21212
## All-Bran with Extra Fiber	0.0000000	280.00000	28.000000	16.00000
## Apple Cinnamon Cheerios	2.6666667	240.00000	2.000000	14.00000
## Apple Jacks	0.0000000	125.00000	1.000000	11.00000
## Basic 4	2.6666667	280.00000	2.666667	24.00000
## Bran Chex	1.4925373	298.50746	5.970149	22.38806
## Bran Flakes	0.0000000	313.43284	7.462687	19.40299
## Cap'n'Crunch	2.6666667	293.33333	0.000000	16.00000
## Cheerios	1.6000000	232.00000	1.600000	13.60000
## Cinnamon Toast Crunch	4.0000000	280.00000	0.000000	17.33333
## Clusters	4.0000000	280.00000	4.000000	26.00000
## Cocoa Puffs	1.0000000	180.00000	0.000000	12.00000
## Corn Chex	0.0000000	280.00000	0.000000	22.00000
## Corn Flakes	0.0000000	290.00000	1.000000	21.00000
## Corn Pops	0.0000000	90.00000	1.000000	13.00000
## Count Chocula	1.0000000	180.00000	0.000000	12.00000
## Cracklin' Oat Bran	6.0000000	280.00000	8.000000	20.00000
## Crispix	0.0000000	220.00000	1.000000	21.00000
## Crispy Wheat & Raisins	1.3333333	186.66667	2.666667	14.66667
## Double Chex	0.0000000	253.33333	1.333333	24.00000
## Froot Loops	1.0000000	125.00000	1.000000	11.00000
## Frosted Flakes	0.0000000	266.66667	1.333333	18.66667

## Frosted Mini-Wheats	0.0000000	0.00000	3.750000	17.50000
## Fruit & Fibre: Dates Walnuts and Oats	2.9850746	238.80597	7.462687	17.91045
## Fruitful Bran	0.0000000	358.20896	7.462687	20.89552
## Fruity Pebbles	1.3333333	180.00000	0.000000	17.33333
## Golden Crisp	0.0000000	51.13636	0.000000	12.50000
## Golden Grahams	1.3333333	373.33333	0.000000	20.00000
## Grape Nuts Flakes	1.1363636	159.09091	3.409091	17.04545
## Grape-Nuts	0.0000000	680.00000	12.000000	68.00000
## Great Grains Pecan	9.0909091	227.27273	9.090909	39.39394
## Honey Graham Ohs	2.0000000	220.00000	1.000000	12.00000
## Honey Nut Cheerios	1.3333333	333.33333	2.000000	15.33333
## Honey-comb	0.0000000	135.33835	0.000000	10.52632
## Just Right Fruit & Nut	1.3333333	226.66667	2.666667	26.66667
## Kix	0.6666667	173.33333	0.000000	14.00000
## Life	2.9850746	223.88060	2.985075	17.91045
## Lucky Charms	1.0000000	180.00000	0.000000	12.00000
## Mueslix Crispy Blend	2.9850746	223.88060	4.477612	25.37313
## Multi-Grain Cheerios	1.0000000	220.00000	2.000000	15.00000
## Nut&Honey Crunch	1.4925373	283.58209	0.000000	22.38806
## Nutri-Grain Almond-Raisin	2.9850746	328.35821	4.477612	31.34328
## Oatmeal Raisin Crisp	4.0000000	340.00000	3.000000	27.00000
## Post Nat. Raisin Bran	1.4925373	298.50746	8.955224	16.41791
## Product 19	0.0000000	320.00000	1.000000	20.00000
## Puffed Rice	0.0000000	0.00000	0.000000	13.00000
## Quaker Oat Squares	2.0000000	270.00000	4.000000	28.00000
## Raisin Bran	1.3333333	280.00000	6.666667	18.66667
## Raisin Nut Bran	4.0000000	280.00000	5.000000	21.00000
## Raisin Squares	0.0000000	0.00000	4.000000	30.00000
## Rice Chex	0.0000000	212.38938	0.000000	20.35398
## Rice Krispies	0.0000000	290.00000	0.000000	22.00000
## Shredded Wheat 'n'Bran	0.0000000	0.00000	5.970149	28.35821
## Shredded Wheat spoon size	0.0000000	0.00000	4.477612	29.85075
## Smacks	1.3333333	93.33333	1.333333	12.00000
## Special K	0.0000000	230.00000	1.000000	16.00000
## Total Corn Flakes	1.0000000	200.00000	0.000000	21.00000
## Total Raisin Bran	1.0000000	190.00000	4.000000	15.00000
## Total Whole Grain	1.0000000	200.00000	3.000000	16.00000
## Triples	1.3333333	333.33333	0.000000	28.00000
## Trix	1.0000000	140.00000	0.000000	13.00000
## Wheat Chex	1.4925373	343.28358	4.477612	25.37313
## Wheaties	1.0000000	200.00000	3.000000	17.00000
## Wheaties Honey Gold	1.3333333	266.66667	1.333333	21.33333
##		sugars	shelf	potassium
## 100% Bran	18.181818		3	848.48485
## All-Bran	15.151515		3	969.69697
## All-Bran with Extra Fiber	0.000000		3	660.00000
## Apple Cinnamon Cheerios	13.333333		1	93.33333
## Apple Jacks	14.000000		2	30.00000
## Basic 4	10.666667		3	133.33333
## Bran Chex	8.955224		1	186.56716
## Bran Flakes	7.462687		3	283.58209
## Cap'n'Crunch	16.000000		2	46.66667
## Cheerios	0.800000		1	84.00000
## Cinnamon Toast Crunch	12.000000		2	60.00000

## Clusters	14.000000	3	210.00000	enriched
## Cocoa Puffs	13.000000	2	55.00000	enriched
## Corn Chex	3.000000	1	25.00000	enriched
## Corn Flakes	2.000000	1	35.00000	enriched
## Corn Pops	12.000000	2	20.00000	enriched
## Count Chocula	13.000000	2	65.00000	enriched
## Cracklin' Oat Bran	14.000000	3	320.00000	enriched
## Crispix	3.000000	3	30.00000	enriched
## Crispy Wheat & Raisins	13.333333	3	160.00000	enriched
## Double Chex	6.666667	3	106.66667	enriched
## Froot Loops	13.000000	2	30.00000	enriched
## Frosted Flakes	14.666667	1	33.33333	enriched
## Frosted Mini-Wheats	8.750000	2	125.00000	enriched
## Fruit & Fibre: Dates Walnuts and Oats	14.925373	3	298.50746	enriched
## Fruitful Bran	17.910448	3	283.58209	enriched
## Fruity Pebbles	16.000000	2	33.33333	enriched
## Golden Crisp	17.045455	1	45.45455	enriched
## Golden Grahams	12.000000	2	60.00000	enriched
## Grape Nuts Flakes	5.681818	3	96.59091	enriched
## Grape-Nuts	12.000000	3	360.00000	enriched
## Great Grains Pecan	12.121212	3	303.03030	enriched
## Honey Graham Ohs	11.000000	2	45.00000	enriched
## Honey Nut Cheerios	13.333333	1	120.00000	enriched
## Honey-comb	8.270677	1	26.31579	enriched
## Just Right Fruit & Nut	12.000000	3	126.66667	100%
## Kix	2.000000	2	26.66667	enriched
## Life	8.955224	2	141.79104	enriched
## Lucky Charms	12.000000	2	55.00000	enriched
## Mueslix Crispy Blend	19.402985	3	238.80597	enriched
## Multi-Grain Cheerios	6.000000	1	90.00000	enriched
## Nut&Honey Crunch	13.432836	2	59.70149	enriched
## Nutri-Grain Almond-Raisin	10.447761	3	194.02985	enriched
## Oatmeal Raisin Crisp	20.000000	3	240.00000	enriched
## Post Nat. Raisin Bran	20.895522	3	388.05970	enriched
## Product 19	3.000000	3	45.00000	100%
## Puffed Rice	0.000000	3	15.00000	none
## Quaker Oat Squares	12.000000	3	220.00000	enriched
## Raisin Bran	16.000000	2	320.00000	enriched
## Raisin Nut Bran	16.000000	3	280.00000	enriched
## Raisin Squares	12.000000	3	220.00000	enriched
## Rice Chex	1.769912	1	26.54867	enriched
## Rice Krispies	3.000000	1	35.00000	enriched
## Shredded Wheat 'n'Bran	0.000000	1	208.95522	none
## Shredded Wheat spoon size	0.000000	1	179.10448	none
## Smacks	20.000000	2	53.33333	enriched
## Special K	3.000000	1	55.00000	enriched
## Total Corn Flakes	3.000000	3	35.00000	100%
## Total Raisin Bran	14.000000	3	230.00000	100%
## Total Whole Grain	3.000000	3	110.00000	100%
## Triples	4.000000	3	80.00000	enriched
## Trix	12.000000	2	25.00000	enriched
## Wheat Chex	4.477612	1	171.64179	enriched
## Wheaties	3.000000	1	110.00000	enriched
## Wheaties Honey Gold	10.666667	1	80.00000	enriched

##	Kilocalories
## 100% Bran	0.21212121
## All-Bran	0.21212121
## All-Bran with Extra Fiber	0.10000000
## Apple Cinnamon Cheerios	0.14666667
## Apple Jacks	0.11000000
## Basic 4	0.17333333
## Bran Chex	0.13432836
## Bran Flakes	0.13432836
## Cap'n'Crunch	0.16000000
## Cheerios	0.08800000
## Cinnamon Toast Crunch	0.16000000
## Clusters	0.22000000
## Cocoa Puffs	0.11000000
## Corn Chex	0.11000000
## Corn Flakes	0.10000000
## Corn Pops	0.11000000
## Count Chocula	0.11000000
## Cracklin' Oat Bran	0.22000000
## Crispix	0.11000000
## Crispy Wheat & Raisins	0.13333333
## Double Chex	0.13333333
## Froot Loops	0.11000000
## Frosted Flakes	0.14666667
## Frosted Mini-Wheats	0.12500000
## Fruit & Fibre: Dates Walnuts and Oats	0.17910448
## Fruitful Bran	0.17910448
## Fruity Pebbles	0.14666667
## Golden Crisp	0.11363636
## Golden Grahams	0.14666667
## Grape Nuts Flakes	0.11363636
## Grape-Nuts	0.44000000
## Great Grains Pecan	0.36363636
## Honey Graham Ohs	0.12000000
## Honey Nut Cheerios	0.14666667
## Honey-comb	0.08270677
## Just Right Fruit & Nut	0.18666667
## Kix	0.07333333
## Life	0.14925373
## Lucky Charms	0.11000000
## Mueslix Crispy Blend	0.23880597
## Multi-Grain Cheerios	0.10000000
## Nut&Honey Crunch	0.17910448
## Nutri-Grain Almond-Raisin	0.20895522
## Oatmeal Raisin Crisp	0.26000000
## Post Nat. Raisin Bran	0.17910448
## Product 19	0.10000000
## Puffed Rice	0.05000000
## Quaker Oat Squares	0.20000000
## Raisin Bran	0.16000000
## Raisin Nut Bran	0.20000000
## Raisin Squares	0.18000000
## Rice Chex	0.09734513
## Rice Krispies	0.11000000

```
## Shredded Wheat 'n'Bran      0.13432836
## Shredded Wheat spoon size  0.13432836
## Smacks                      0.14666667
## Special K                   0.11000000
## Total Corn Flakes           0.11000000
## Total Raisin Bran           0.14000000
## Total Whole Grain           0.10000000
## Triples                     0.14666667
## Trix                        0.11000000
## Wheat Chex                  0.14925373
## Wheaties                    0.10000000
## Wheaties Honey Gold         0.14666667
```

Create a training set using random number generator engine.

```
RandomNum <- runif(50, 1, 250)
RandomNum
```

```
## [1] 72.201902 136.323191 1.966769 127.743269 198.734544 188.495347
## [7] 172.370883 243.217947 149.975718 220.571386 145.497710 174.453347
## [13] 162.546077 224.003638 5.362571 76.065692 38.487820 127.080343
## [19] 235.445472 228.992046 51.161720 102.734039 96.243865 141.148316
## [25] 234.501215 237.608263 194.526742 198.472472 37.051598 145.302563
## [31] 105.526070 66.552696 246.009680 93.730140 106.448240 77.430509
## [37] 195.901374 22.425250 64.643536 212.222761 27.329210 90.108189
## [43] 228.331349 123.749451 245.510933 92.543546 245.896779 71.934679
## [49] 11.120752 225.602113
```

Print the summary statistics of your dataset

```
summary(UScereal1)
```

```
## Manufacturer calorie_content protein fat sodium
## G:22 Min. : 50.0 Min. : 0.7519 Min. :0.000 Min. : 0.0
## K:21 1st Qu.:110.0 1st Qu.: 2.0000 1st Qu.:0.000 1st Qu.:180.0
## N: 3 Median :134.3 Median : 3.0000 Median :1.000 Median :232.0
## P: 9 Mean :149.4 Mean : 3.6837 Mean :1.423 Mean :237.8
## Q: 5 3rd Qu.:179.1 3rd Qu.: 4.4776 3rd Qu.:2.000 3rd Qu.:290.0
## R: 5 Max. :440.0 Max. :12.1212 Max. :9.091 Max. :787.9
## fibre carbo sugars shelf
## Min. : 0.000 Min. :10.53 Min. : 0.00 Min. :1.000
## 1st Qu.: 0.000 1st Qu.:15.00 1st Qu.: 4.00 1st Qu.:1.000
## Median : 2.000 Median :18.67 Median :12.00 Median :2.000
## Mean : 3.871 Mean :19.97 Mean :10.05 Mean :2.169
## 3rd Qu.: 4.478 3rd Qu.:22.39 3rd Qu.:14.00 3rd Qu.:3.000
## Max. :30.303 Max. :68.00 Max. :20.90 Max. :3.000
## potassium vitamins
## Min. : 15.00 100% : 5
## 1st Qu.: 45.00 enriched:57
## Median : 96.59 none : 3
## Mean :159.12
## 3rd Qu.:220.00
## Max. :969.70
```

Use any of the numerical variables from the dataset and perform the following statistical functions • Mean
• Median • Mode • Range


```
#Mean function
calorie_mean<-mean(UScereal1$calorie_content, na.rm=TRUE)
print(calorie_mean)
```

```
## [1] 149.4083
```

```
#Median function
calorie_median<-median(UScereal1$calorie_content, na.rm=TRUE)
print(calorie_median)
```

```
## [1] 134.3284
```

```
# To find Mode we need to create a function.
findmode <- function(x) {
  mode_value <- unique(x)
  mode_value[which.max(tabulate(match(x, mode_value)))]
## Calculate the mode using the function.
  calorie_mode <- findmode(UScereal1$calorie_content)
  print(calorie_mode)
}
```

```
#Mean function
#To find Range
calorie_range <- max(UScereal1$calorie_content, na.rm=TRUE) - min(UScereal1$calorie_content, na.rm=TRUE)
print(calorie_range)
```

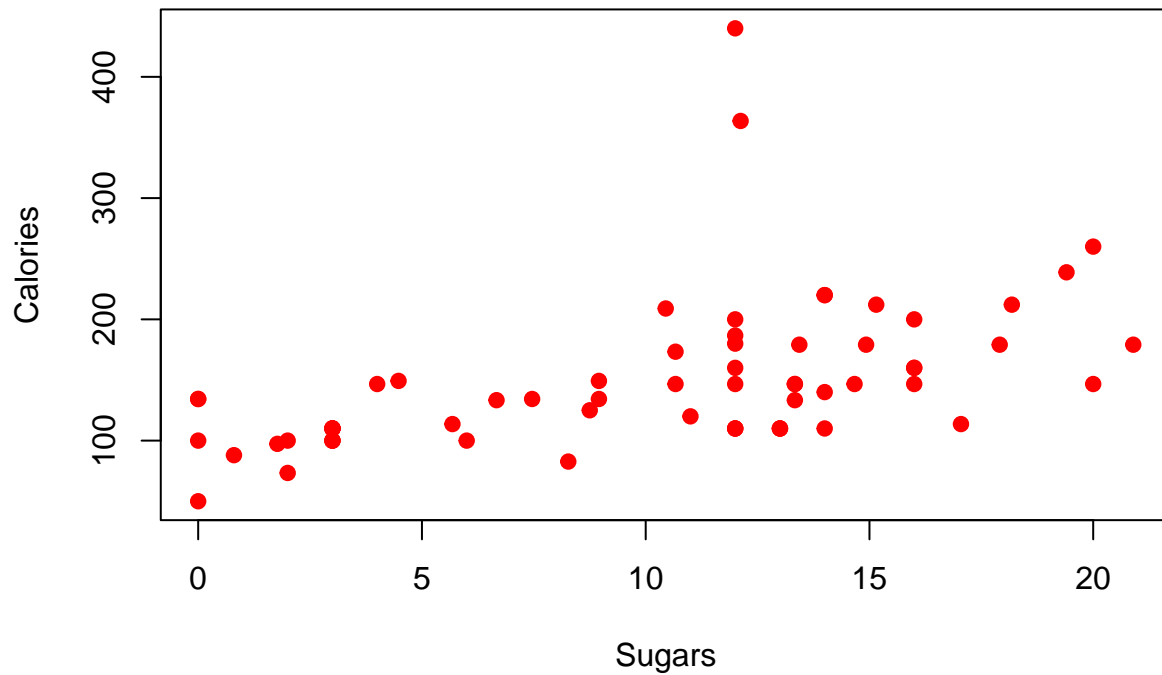
```
## [1] 390
```

Scatter Plot

Plot a scatter plot for any 2 variables in your dataset

```
#Mean function
plot(UScereal1$sugars, UScereal1$calorie_content, col='red', pch=19,
      xlab='Sugars', ylab='Calories', main='Scatterplot of Two Variables')
```

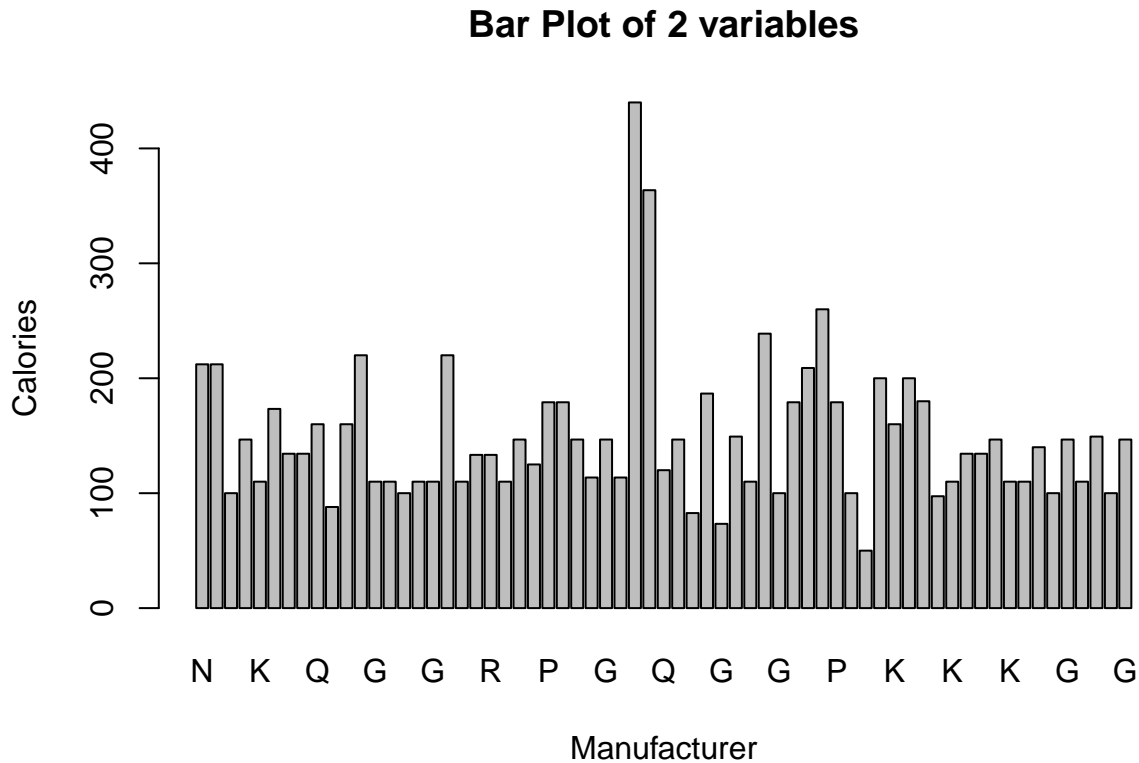
Scatterplot of Two Variables



Bar Plot

bar plot for any 2 variables in your dataset

```
# Add labels to bar plot
barplot(UScereal1$calorie_content,
names.arg = UScereal1$Manufacturer,
main = "Bar Plot of 2 variables",
xlab = "Manufacturer",
ylab = 'Calories')
```

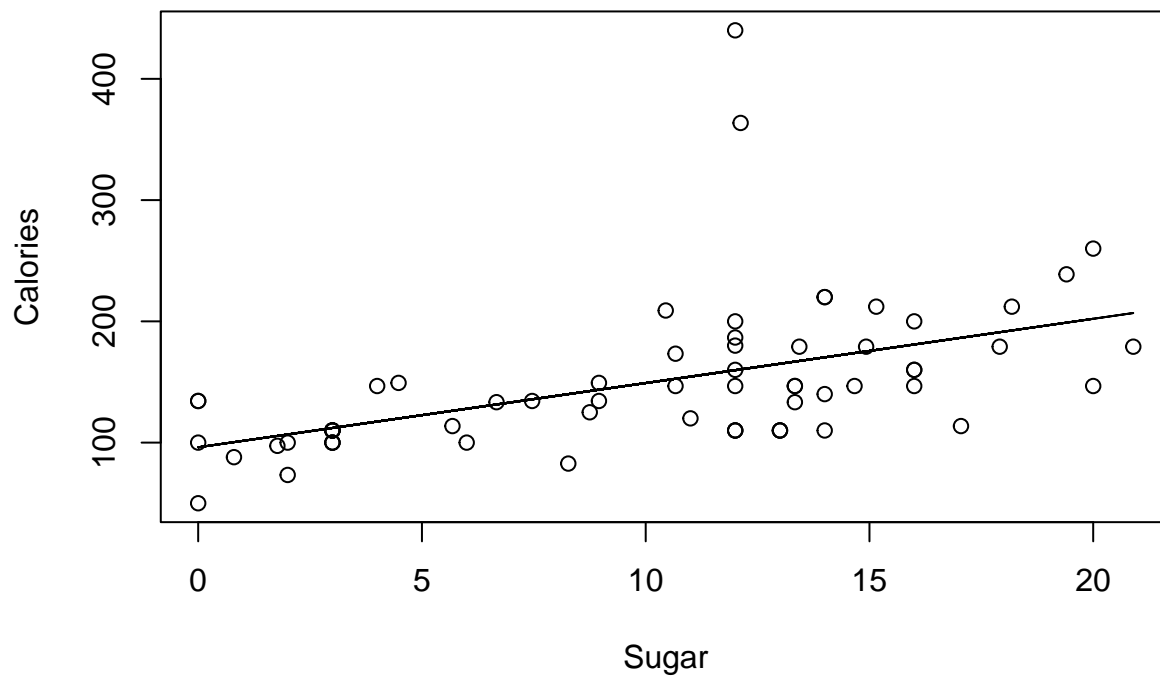


Linear Regression Model

Find the correlation between any 2 variables by applying least square linear regression model

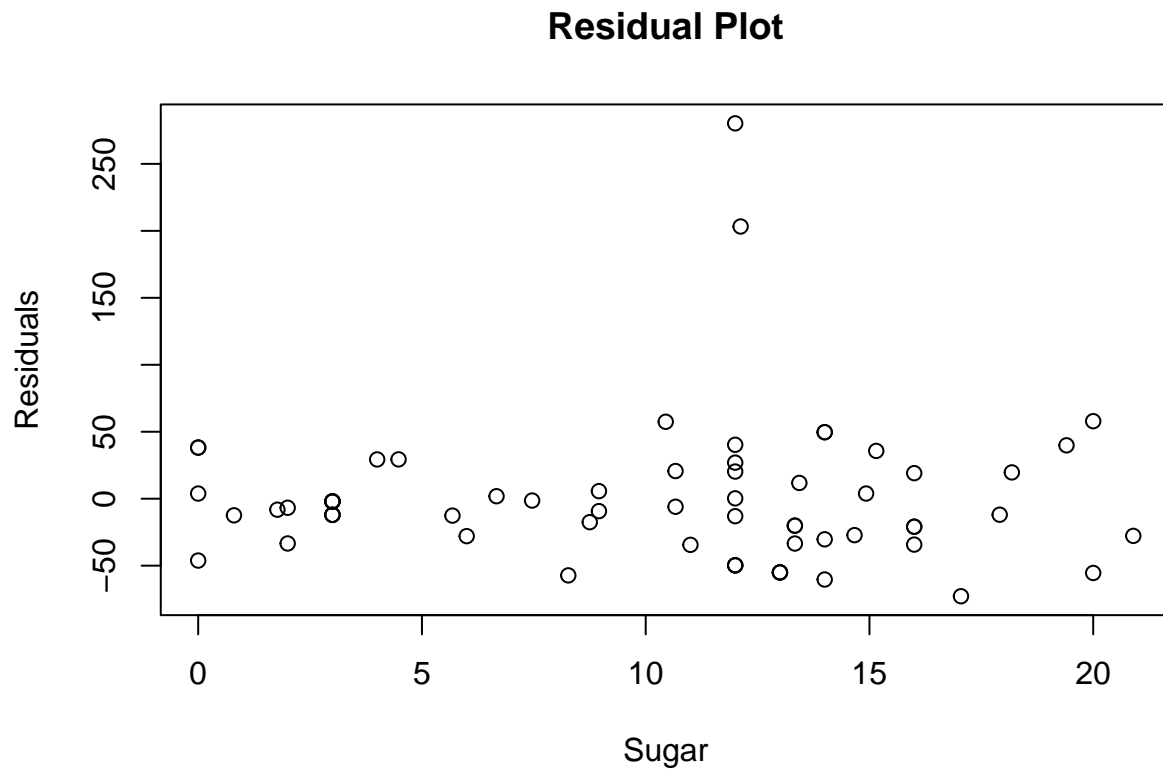
```
# Linear Regression Model
model1 <- lm(UScereal1$calorie_content~UScereal1$sugars)
yfit<-model1$fitted.values
plot(UScereal1$sugars, UScereal1$calorie_content, xlab='Sugar', ylab='Calories',
main='Calorie Content based on Sugars')
lines(UScereal1$sugars, yfit)
```

Calorie Content based on Sugars



Residual Plot

```
#residual plot  
residuals <- UScereal1$calorie_content - yfit  
plot(UScereal1$sugars, residuals, xlab='Sugar', ylab='Residuals', main='Residual Plot')
```



```
#Correlation  
cor(UScereal1$sugars, UScereal1$calorie_content)
```

```
## [1] 0.4952942
```