

Assignment_4

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2023-09-14

```
suppressPackageStartupMessages({  
  library(tidyverse, quietly = TRUE)    # loading ggplot2 and dplyr  
})  
data(ChickWeight)
```

1.

c) Only include observations from day 10 or 20:

```
ChickWeight %>%  
filter(Time == 10 | Time == 20) %>%  
head()
```

```
##   weight Time Chick Diet  
## 1    93   10     1    1  
## 2   199   20     1    1  
## 3   103   10     2    1  
## 4   209   20     2    1  
## 5    99   10     3    1  
## 6   198   20     3    1
```

d) Group by diet and calculate mean and sd for each:

```
ChickWeight %>%  
filter(Time == 10 | Time == 20) %>%  
group_by(Diet, Time) %>%  
summarise(mean = mean(weight), sd = sd(weight))
```

```
## `summarise()` has grouped output by 'Diet'. You can override using the  
## `.groups` argument.
```

```
## # A tibble: 8 x 4  
## # Groups:   Diet [4]  
##   Diet    Time mean    sd  
##   <fct> <dbl> <dbl> <dbl>  
## 1 1      10  93.1  22.5  
## 2 1      20 170.   55.4  
## 3 2      10 108.   24.3  
## 4 2      20 206.   70.3  
## 5 3      10 117.   20.2  
## 6 3      20 259.   65.2  
## 7 4      10 126.   11.4
```

```
## 8 4      20 234.    37.6
```

2.

```
Body <- read.csv('http://www.openintro.org/stat/data/bdims.csv')
```

b) Create new column for sex:

```
Body %>%  
mutate(sex.MF = if_else(sex == 1, 'Male', 'Female')) %>%  
head()
```

```
##   bia.di bii.di bit.di che.de che.di elb.di wri.di kne.di ank.di sho.gi che.gi  
## 1   42.9   26.0   31.5   17.7   28.0   13.1   10.4   18.8   14.1  106.2   89.5  
## 2   43.7   28.5   33.5   16.9   30.8   14.0   11.8   20.6   15.1  110.5   97.0  
## 3   40.1   28.2   33.3   20.9   31.7   13.9   10.9   19.7   14.1  115.1   97.5  
## 4   44.3   29.9   34.0   18.4   28.2   13.9   11.2   20.9   15.0  104.5   97.0  
## 5   42.5   29.9   34.0   21.5   29.4   15.2   11.6   20.7   14.9  107.5   97.5  
## 6   43.3   27.0   31.5   19.6   31.3   14.0   11.5   18.8   13.9  119.8   99.9  
##   wai.gi nav.gi hip.gi thi.gi bic.gi for.gi kne.gi cal.gi ank.gi wri.gi age  
## 1   71.5   74.5   93.5   51.5   32.5   26.0   34.5   36.5   23.5   16.5   21  
## 2   79.0   86.5   94.8   51.5   34.4   28.0   36.5   37.5   24.5   17.0   23  
## 3   83.2   82.9   95.0   57.3   33.4   28.8   37.0   37.3   21.9   16.9   28  
## 4   77.8   78.8   94.0   53.0   31.0   26.2   37.0   34.8   23.0   16.6   23  
## 5   80.0   82.5   98.5   55.4   32.0   28.4   37.7   38.6   24.4   18.0   22  
## 6   82.5   80.1   95.3   57.5   33.0   28.0   36.6   36.1   23.5   16.9   21  
##   wgt   hgt sex sex.MF  
## 1  65.6 174.0   1   Male  
## 2  71.8 175.3   1   Male  
## 3  80.7 193.5   1   Male  
## 4  72.6 186.5   1   Male  
## 5  78.8 187.2   1   Male  
## 6  74.8 181.5   1   Male
```

c)

```
Body %>%  
mutate(sex.MF = if_else(sex == 1, 'Male', 'Female')) %>%  
mutate(BMI = wgt/(hgt^2)) %>%  
head()
```

```
##   bia.di bii.di bit.di che.de che.di elb.di wri.di kne.di ank.di sho.gi che.gi  
## 1   42.9   26.0   31.5   17.7   28.0   13.1   10.4   18.8   14.1  106.2   89.5  
## 2   43.7   28.5   33.5   16.9   30.8   14.0   11.8   20.6   15.1  110.5   97.0  
## 3   40.1   28.2   33.3   20.9   31.7   13.9   10.9   19.7   14.1  115.1   97.5  
## 4   44.3   29.9   34.0   18.4   28.2   13.9   11.2   20.9   15.0  104.5   97.0  
## 5   42.5   29.9   34.0   21.5   29.4   15.2   11.6   20.7   14.9  107.5   97.5  
## 6   43.3   27.0   31.5   19.6   31.3   14.0   11.5   18.8   13.9  119.8   99.9  
##   wai.gi nav.gi hip.gi thi.gi bic.gi for.gi kne.gi cal.gi ank.gi wri.gi age  
## 1   71.5   74.5   93.5   51.5   32.5   26.0   34.5   36.5   23.5   16.5   21  
## 2   79.0   86.5   94.8   51.5   34.4   28.0   36.5   37.5   24.5   17.0   23  
## 3   83.2   82.9   95.0   57.3   33.4   28.8   37.0   37.3   21.9   16.9   28  
## 4   77.8   78.8   94.0   53.0   31.0   26.2   37.0   34.8   23.0   16.6   23
```

```
## 5 80.0 82.5 98.5 55.4 32.0 28.4 37.7 38.6 24.4 18.0 22
## 6 82.5 80.1 95.3 57.5 33.0 28.0 36.6 36.1 23.5 16.9 21
## wgt hgt sex sex.MF BMI
## 1 65.6 174.0 1 Male 0.002166733
## 2 71.8 175.3 1 Male 0.002336472
## 3 80.7 193.5 1 Male 0.002155319
## 4 72.6 186.5 1 Male 0.002087272
## 5 78.8 187.2 1 Male 0.002248612
## 6 74.8 181.5 1 Male 0.002270640
```

d)

```
Body %>%
mutate(sex.MF = if_else(sex == 1, 'Male', 'Female')) %>%
mutate(BMI = wgt/((hgt/100)^2)) %>%
head()

## bia.di bii.di bit.di che.de che.di elb.di wri.di kne.di ank.di sho.gi che.gi
## 1 42.9 26.0 31.5 17.7 28.0 13.1 10.4 18.8 14.1 106.2 89.5
## 2 43.7 28.5 33.5 16.9 30.8 14.0 11.8 20.6 15.1 110.5 97.0
## 3 40.1 28.2 33.3 20.9 31.7 13.9 10.9 19.7 14.1 115.1 97.5
## 4 44.3 29.9 34.0 18.4 28.2 13.9 11.2 20.9 15.0 104.5 97.0
## 5 42.5 29.9 34.0 21.5 29.4 15.2 11.6 20.7 14.9 107.5 97.5
## 6 43.3 27.0 31.5 19.6 31.3 14.0 11.5 18.8 13.9 119.8 99.9
## wai.gi nav.gi hip.gi thi.gi bic.gi for.gi kne.gi cal.gi ank.gi wri.gi age
## 1 71.5 74.5 93.5 51.5 32.5 26.0 34.5 36.5 23.5 16.5 21
## 2 79.0 86.5 94.8 51.5 34.4 28.0 36.5 37.5 24.5 17.0 23
## 3 83.2 82.9 95.0 57.3 33.4 28.8 37.0 37.3 21.9 16.9 28
## 4 77.8 78.8 94.0 53.0 31.0 26.2 37.0 34.8 23.0 16.6 23
## 5 80.0 82.5 98.5 55.4 32.0 28.4 37.7 38.6 24.4 18.0 22
## 6 82.5 80.1 95.3 57.5 33.0 28.0 36.6 36.1 23.5 16.9 21
## wgt hgt sex sex.MF BMI
## 1 65.6 174.0 1 Male 21.66733
## 2 71.8 175.3 1 Male 23.36472
## 3 80.7 193.5 1 Male 21.55319
## 4 72.6 186.5 1 Male 20.87272
## 5 78.8 187.2 1 Male 22.48612
## 6 74.8 181.5 1 Male 22.70640
```

e)

```
Body %>%
mutate(sex.MF = if_else(sex == 1, 'Male', 'Female')) %>%
mutate(BMI = wgt/((hgt/100)^2)) %>%
mutate(Age.Grp = cut(age, breaks =c(10,20,30,40,50,60,70), right=FALSE)) %>%
head()

## bia.di bii.di bit.di che.de che.di elb.di wri.di kne.di ank.di sho.gi che.gi
## 1 42.9 26.0 31.5 17.7 28.0 13.1 10.4 18.8 14.1 106.2 89.5
## 2 43.7 28.5 33.5 16.9 30.8 14.0 11.8 20.6 15.1 110.5 97.0
## 3 40.1 28.2 33.3 20.9 31.7 13.9 10.9 19.7 14.1 115.1 97.5
## 4 44.3 29.9 34.0 18.4 28.2 13.9 11.2 20.9 15.0 104.5 97.0
## 5 42.5 29.9 34.0 21.5 29.4 15.2 11.6 20.7 14.9 107.5 97.5
## 6 43.3 27.0 31.5 19.6 31.3 14.0 11.5 18.8 13.9 119.8 99.9
```

```
##   wai.gi nav.gi hip.gi thi.gi bic.gi for.gi kne.gi cal.gi ank.gi wri.gi age
## 1   71.5   74.5   93.5   51.5   32.5   26.0   34.5   36.5   23.5   16.5   21
## 2   79.0   86.5   94.8   51.5   34.4   28.0   36.5   37.5   24.5   17.0   23
## 3   83.2   82.9   95.0   57.3   33.4   28.8   37.0   37.3   21.9   16.9   28
## 4   77.8   78.8   94.0   53.0   31.0   26.2   37.0   34.8   23.0   16.6   23
## 5   80.0   82.5   98.5   55.4   32.0   28.4   37.7   38.6   24.4   18.0   22
## 6   82.5   80.1   95.3   57.5   33.0   28.0   36.6   36.1   23.5   16.9   21
##   wgt   hgt sex sex.MF      BMI Age.Grp
## 1 65.6 174.0   1   Male 21.66733 [20,30)
## 2 71.8 175.3   1   Male 23.36472 [20,30)
## 3 80.7 193.5   1   Male 21.55319 [20,30)
## 4 72.6 186.5   1   Male 20.87272 [20,30)
## 5 78.8 187.2   1   Male 22.48612 [20,30)
## 6 74.8 181.5   1   Male 22.70640 [20,30)
```

f)

```
Body %>% mutate(sex.MF = if_else(sex == 1, 'Male', 'Female')) %>%
mutate(BMI = wgt/((hgt/100)^2)) %>%
mutate(Age.Grp = cut(age, breaks =c(10,20,30,40,50,60,70), right=FALSE)) %>%
group_by(sex.MF, Age.Grp) %>%
summarise(mean = mean(BMI))
```

```
## `summarise()` has grouped output by 'sex.MF'. You can override using the
## `.groups` argument.
```

```
## # A tibble: 12 x 3
## # Groups:   sex.MF [2]
##   sex.MF Age.Grp mean
##   <chr> <fct> <dbl>
## 1 Female [10,20) 21.8
## 2 Female [20,30) 21.8
## 3 Female [30,40) 22.5
## 4 Female [40,50) 24.3
## 5 Female [50,60) 22.7
## 6 Female [60,70) 23.7
## 7 Male   [10,20) 25.5
## 8 Male   [20,30) 24.2
## 9 Male   [30,40) 24.9
## 10 Male  [40,50) 26.4
## 11 Male  [50,60) 24.8
## 12 Male  [60,70) 23.9
```