BMI Assignment

Diane Nguyen August 30, 2018

Body Mass Index: Part 1 More than 300 students responded to an anomymous survey at the beginning of the semester. Two questions asked in the survey were their height and weight. The computer randomly selects 200 students from the data set. The following shows the weights (in pounds) and heights (in inches) from the random sample.

weight <- c(110, 135, 132, 107, 120, 150, 117, 127, 160, 145, 135, 145, 120, 140, 140, 105, 140, 160, 1 height <- c(63, 67, 64, 63, 60, 74, 65, 63, 74, 69, 59, 70, 65, 67, 66, 63, 66, 68, 60, 66, 69, 67, 72,

The body mass index (BMI) is defined as the body mass divided by the square of body height. The BMI is an attempt to quantify the amount of tissue mass (muscle, fat, and bone) in an individual, and then categorize that person as underweight, normal weight, overweight, or obese based on that value.

BMI is usually measured in units of kg/m2, resulting from mass in kilograms and height in metres. In our survey data, weight is measured in pounds and height is measured in inches. So we need to do a conversion. One pound of weight corresponds to a mass of 0.4536 kg and one inch is 0.0254 m, simple calculation shows that

BMI (in kg/m2) = $703 \times (\text{Wpound / H2in})$,

where Wpound is the body weight in pounds and Hin is height in inches.

Use the formula to calculate the BMI of the students in the sample. Be sure to use the conversion factor 703 in your calculation; otherwise your answers may not agree with computer's answers.

a. What are the mean and sample standard deviation of the BMI in the sample?

```
# Enter code here
BMI<-703*(weight/height^2)
mean(BMI)</pre>
```

```
## [1] 22.64391
sd(BMI)
```

[1] 3.938212

b. What is the median of the BMI in the sample?

```
# Enter code here
median(BMI)
```

[1] 21.9247

c. Calculate the correlation matrix between weight, height and BMI.

```
# Enter code here
#Correlation between weight and height =
cor(weight,height)
```

```
## [1] 0.6087314
```

```
#Correlation between weight and BMI =
cor(weight,BMI)
```

[1] 0.845144

#Correlation between height and BMI =
cor(height,BMI)

[1] 0.1001609

d. What are the maximum and minimum of BMI in the data? Give your answers to 2 decimal places.

Enter code here
max(BMI)

[1] 37.94812
min(BMI)

[1] 14.92184

round(max(BMI),2)

[1] 37.95

round(min(BMI),2)

[1] 14.92