BHao_Assign11

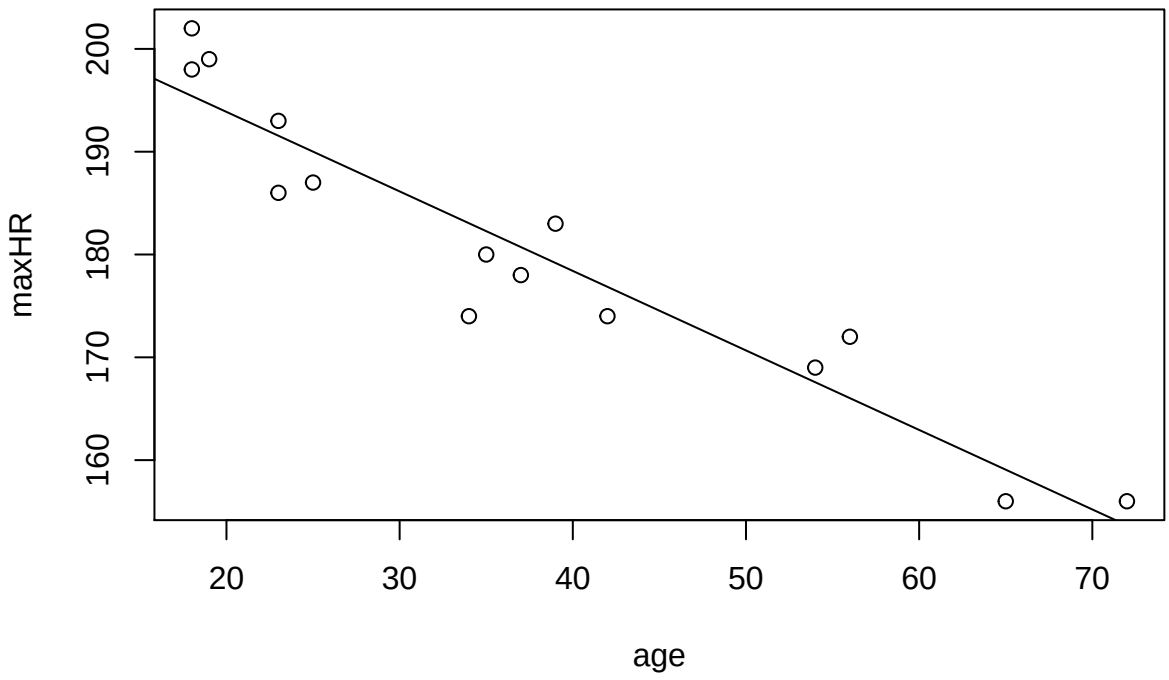
- Fitting max heart rate to age using lm results in the following equation: max heart rate = 209.3416 - 0.7744 * age
- The effect of age on max heart rate is significant
- The significant level is at the 99.9% level

```
age = c(18,23,25,35,65,54,34,56,72,19,23,42,18,39,37)
maxHR = c(202,186,187,180,156,169,174,172,156,199,193,174,198,183,178)

age_hr = lm(maxHR ~ age)
summary(age_hr)
```

```
##
## Call:
## lm(formula = maxHR ~ age)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -9.045 -2.932  1.424  3.201  6.580
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) 209.34158    2.90977   71.94  < 2e-16 ***
## age          -0.77344    0.07101  -10.89 6.62e-08 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 4.646 on 13 degrees of freedom
## Multiple R-squared:  0.9012, Adjusted R-squared:  0.8936
## F-statistic: 118.6 on 1 and 13 DF,  p-value: 6.617e-08
```

```
plot(maxHR ~ age)
abline(age_hr$coefficients[1], age_hr$coefficients[2])
```



- Fitting a multiple regression the auto data set results in the equation below: mpg = 45.2511 - 0.0060 * disp - 0.0436 * hp - 0.0053 * weight - 0.0231 * accel

```
mpg = read.table('auto-mpg.data')
names(mpg) = c('disp', 'hp', 'weight', 'accel', 'mpg')

lm_model = lm(mpg ~ ., data = mpg)
summary(lm_model)
```

```
##
## Call:
## lm(formula = mpg ~ ., data = mpg)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -11.378  -2.793  -0.333   2.193  16.256
##
## Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept) 45.2511397  2.4560447  18.424  < 2e-16 ***
## disp        -0.0060009  0.0067093  -0.894  0.37166
## hp          -0.0436077  0.0165735  -2.631  0.00885 **
## weight      -0.0052805  0.0008109  -6.512  2.3e-10 ***
## accel       -0.0231480  0.1256012  -0.184  0.85388
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
```

```
## Residual standard error: 4.247 on 387 degrees of freedom
## Multiple R-squared:  0.707,  Adjusted R-squared:  0.704
## F-statistic: 233.4 on 4 and 387 DF,  p-value: < 2.2e-16
```