creatinine

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```
library(mosaic)
library(tidyverse)
creatinine = read.csv('../data/creatinine.csv')

lm1 = lm(creatclear ~ age, data = creatinine)
new_data = data.frame(age = c(55, 40, 60))
predict(lm1, new_data)
```

```
##        1        2        3
## 113.7230 123.0203 110.6240
```

1. After using the predict function on the linear model taken from the data, at Age = 55, we can expect a creatinine clearence rate of about 113.7.

```
coef(lm1)
```

```
## (Intercept)         age
## 147.8129158  -0.6198159
```

2. When using the coefficient function on our linear model, we see a negative coefficient on the age variable, and can extrapolate that with every additional year a person ages, we can expect a decrease in creatinine clearence rate of .6198 ml/minute per year.

```
summary(lm1)
```

```
##
## Call:
## lm(formula = creatclear ~ age, data = creatinine)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -18.2249  -4.6175   0.2221   4.7212  15.8221
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) 147.81292    1.37965  107.14   <2e-16 ***
## age          -0.61982    0.03475  -17.84   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 6.911 on 155 degrees of freedom
## Multiple R-squared:  0.6724, Adjusted R-squared:  0.6703
## F-statistic: 318.2 on 1 and 155 DF,  p-value: < 2.2e-16
```

```
135-123.0203
```

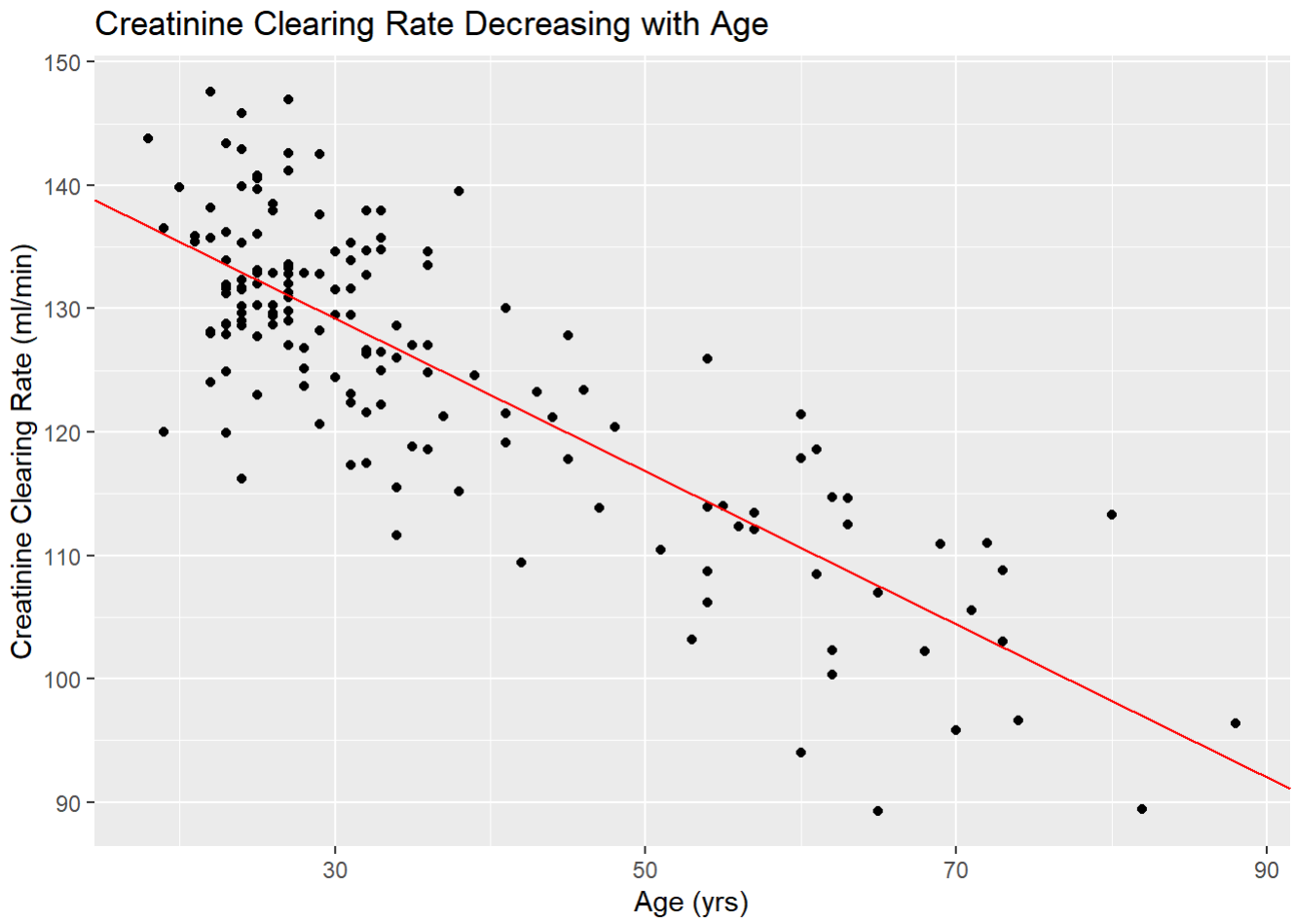
```
## [1] 11.9797
```

```
112-110.6240
```

```
## [1] 1.376
```

3. We Can subtract our predicted creatinine clearence rate, for each age, from our actual rate to determine the residuals for each individual. From this basic subtraction we see that the 40 year old has a positive residual of 11.9797 and the 60 year old hasa positive residual of 1.376. We can say that the 40 year old is healthier because they have a greater positive residual, and having a higher creatinine clearence rate is better.

```
ggplot(data = creatinine) +
  geom_point(mapping = aes(x = age, y = creatclear)) +
  geom_abline(intercept = coef(lm1)[1] , slope = coef(lm1)[2], color="red")+
  labs(title = "Creatinine Clearing Rate Decreasing with Age") +
  labs(
    y = "Creatinine Clearing Rate (ml/min)",
    x = "Age (yrs)")
```


Creatinine Clearing Rate Decreasing with Age
Creatinine Clearing Rate (ml/min)
150
140
130
120
110
100
90
30
50
70
90
Age (yrs)