Regression

Prabidhik KC

2022-11-22

```
## loading the necessary libraries
library(tidyverse)
```

```
## -- Attaching packages --------------------------------------- tidyverse 1.3.1 --

## v ggplot2 3.3.6     v purrr   0.3.4
## v tibble  3.1.8     v dplyr   1.0.9
## v tidyr   1.2.0     v stringr 1.4.1
## v readr   2.1.2     v forcats 0.5.1

## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

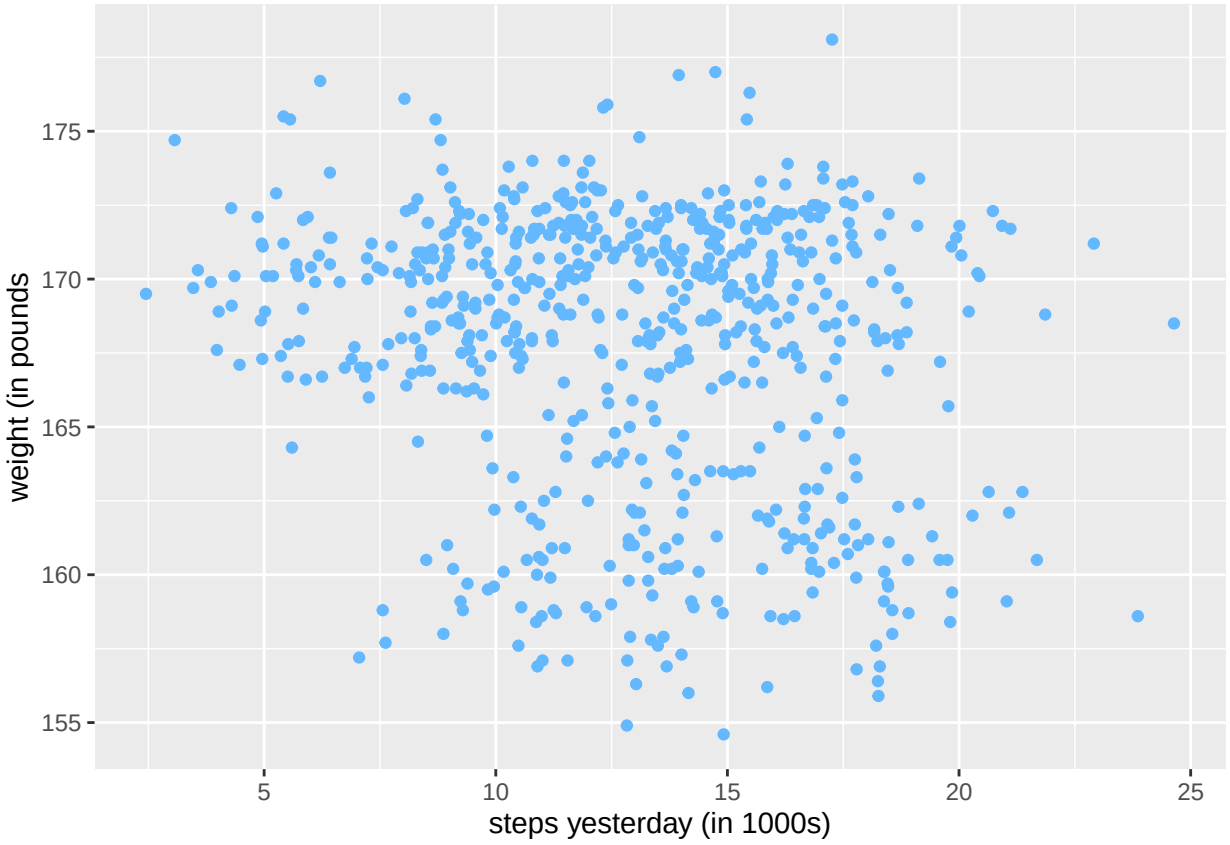
```
library(gov50data)
```

Looking at the data

```
health
```

```
## # A tibble: 644 x 6
##    date       active_calories steps weight steps_lag calorie_lag
##    <date>               <dbl> <dbl>  <dbl>     <dbl>       <dbl>
##  1 2015-08-09            480  17.5    168      NA           NA
##  2 2015-08-10            996. 18.4    169.     17.5         480
##  3 2015-08-11           1127. 19.6    168      18.4         996.
##  4 2015-08-12            522. 10.4    167.     19.6        1127.
##  5 2015-08-13            844. 18.7    168.     10.4         522.
##  6 2015-08-14            396.  9.14   168.     18.7         844.
##  7 2015-08-15            423.  8.69   166.      9.14        396.
##  8 2015-08-16            958. 13.8    168.      8.69        423.
##  9 2015-08-17            597. 11.9    169      13.8         958.
## 10 2015-08-18           1378. 24.6    169.     11.9         597.
## # ... with 634 more rows
```

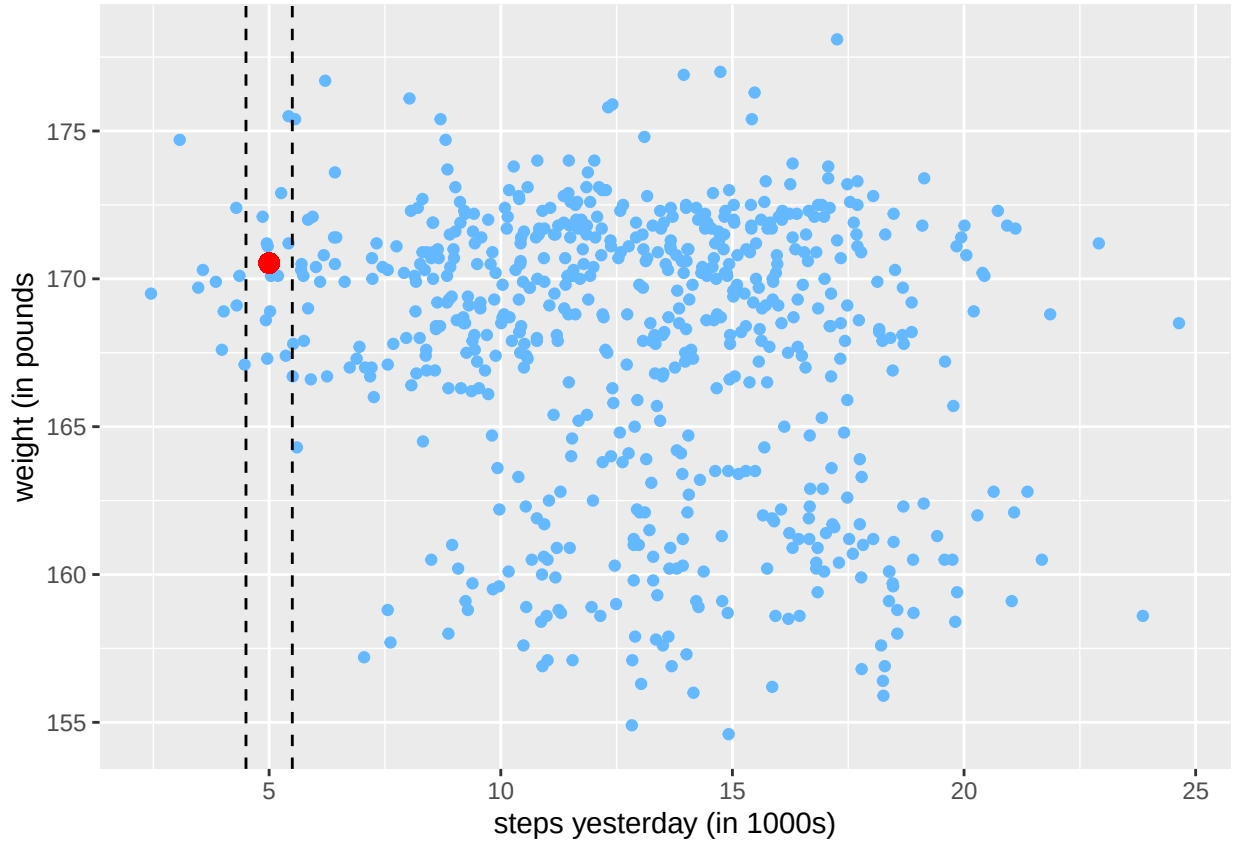
```
health <- health %>%
  drop_na()
health %>%
  ggplot(aes(x = steps_lag, y = weight)) +
  geom_point(color = "steelblue1") +
  labs(x = "steps yesterday (in 1000s)",
       y = "weight (in pounds")
```



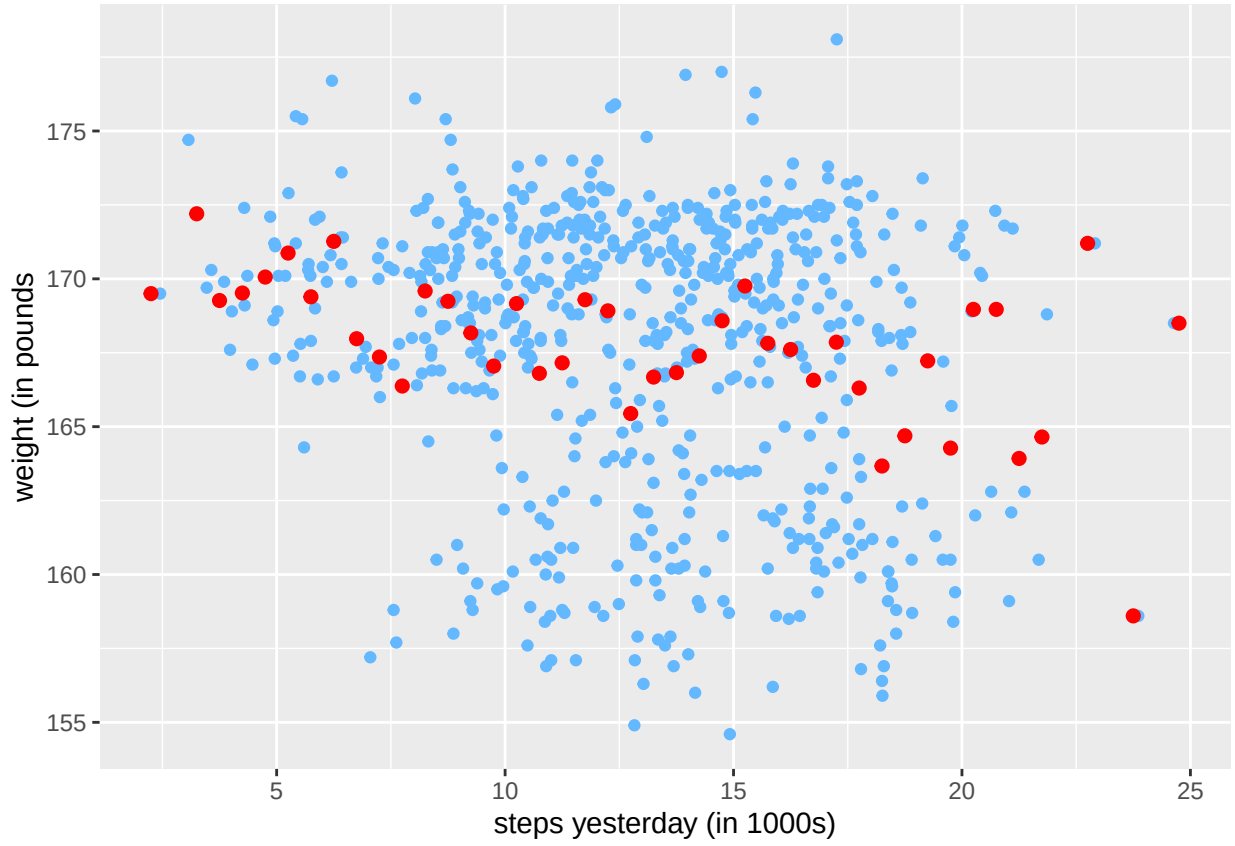

```
mean_wt_5ksteps <- health %>%
  filter(round(steps_lag) == 5) %>%
  summarize(mean(weight)) %>%
  pull()


mean_wt_5ksteps
```

```
## [1] 170.5333
```

```
health %>%
  ggplot(aes(x = steps_lag, y = weight)) +
  geom_point(color = "steelblue1") +
  labs(x = "steps yesterday (in 1000s)",
       y = "weight (in pounds") +
  geom_vline(xintercept = c(4.5, 5.5), linetype = "dashed") +
  geom_point(aes(x = 5, y = mean_wt_5ksteps), size = 3, color = "red")
```

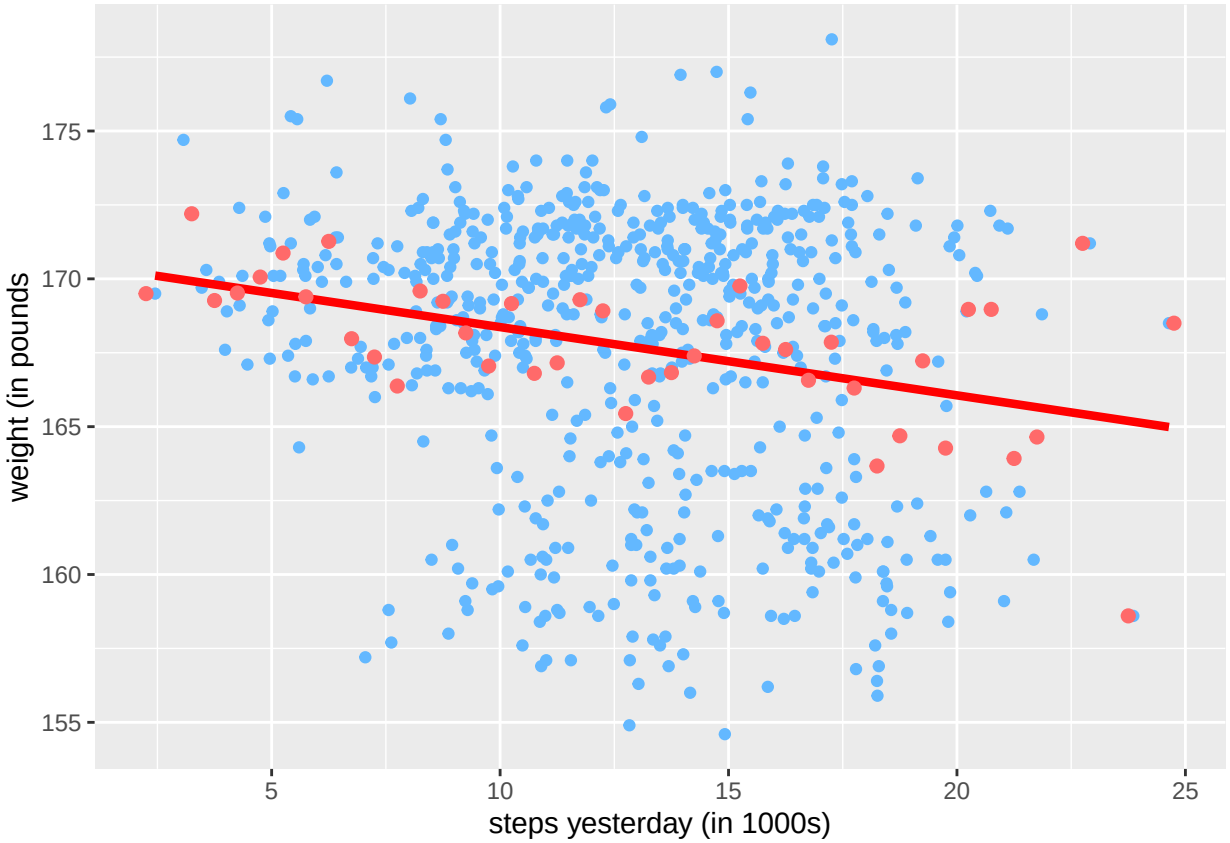



```
health %>%
  ggplot(aes(x = steps_lag, y = weight)) +
  geom_point(color = "steelblue1") +
  labs(x = "steps yesterday (in 1000s)",
       y = "weight (in pounds") +
  stat_summary_bin(fun = "mean", geom = "point", size = 2, color = "red", binwidth = 0.5)
```




```
health %>%
  ggplot(aes(x = steps_lag, y = weight)) +
  geom_point(color = "steelblue1") +
  labs(x = "steps yesterday (in 1000s)",
       y = "weight (in pounds") +
  geom_smooth(method = "lm", se = FALSE, color = "red", size = 1.5) +
  stat_summary_bin(fun = "mean", geom = "point", size = 2, color = "indianred1", binwidth = 0.5)
```

```
## `geom_smooth()` using formula 'y ~ x'
```

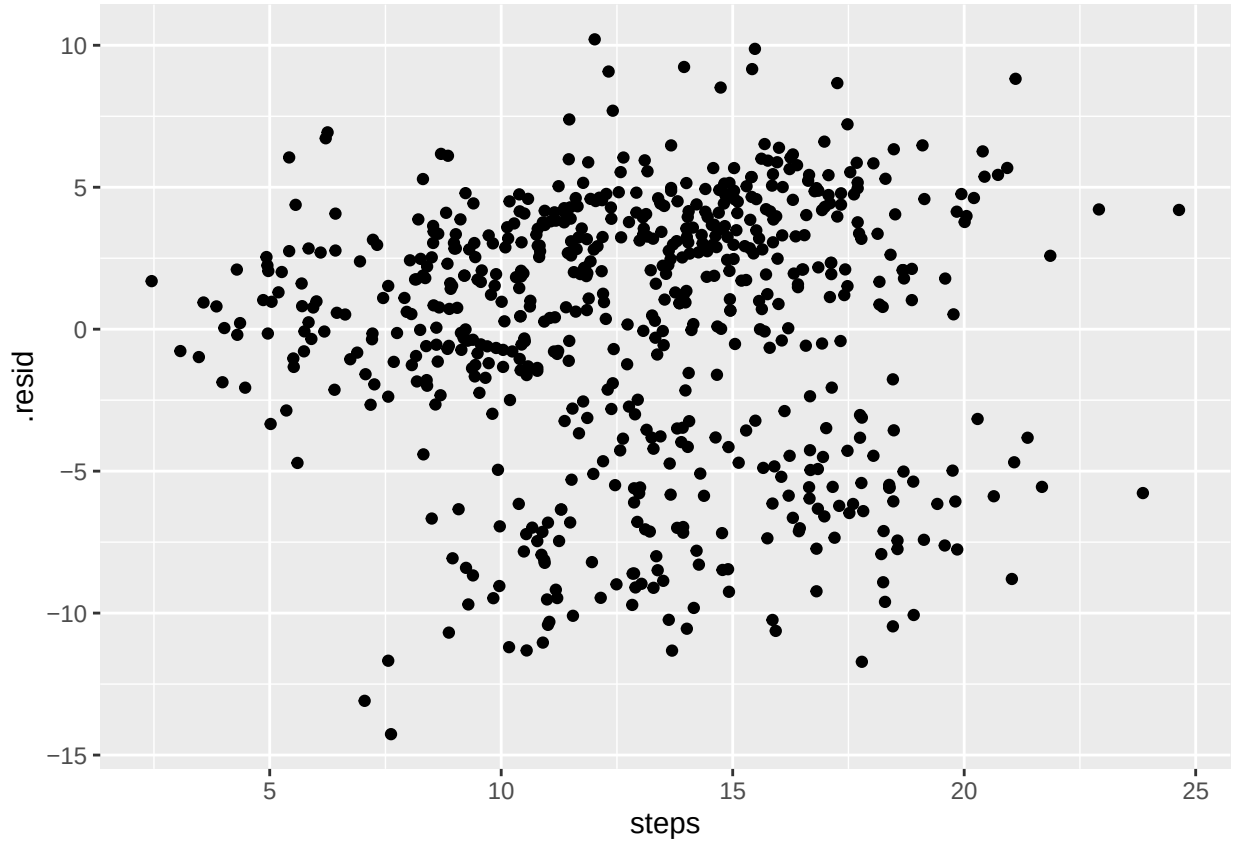


Lienar Models

```
fit <- lm(weight ~ steps, data = health)
fit
```

```
##
## Call:
## lm(formula = weight ~ steps, data = health)
##
## Coefficients:
## (Intercept)        steps
##    170.5493      -0.2212
```

```
library(broom)
augment(fit) %>%
  ggplot(aes(x = steps, y = .resid)) +
  geom_point()
```




```
coef(fit)
```

```
## (Intercept)       steps
## 170.5492866  -0.2211606
```

The coefficient on steps is -0.2211606