WU #23

Math 58B, Spring 2022

Thursday, April 21, 2022

Your Name: _____

Names of people you worked with: _____

Instructions: Work on this problem in class with your group. Do your best. This piece of paper will be collected during class.

Task: Consider a sample of 15 books (5 observations are shown here). Given the regression of `weight` (grams of book) on `volume` (cm^3) and `cover` (hardback or paperback), interpret the two coefficients below (0.718 and -184.05).

```
##   volume weight cover
## 1    885    800    hb
## 2   1016    950    hb
## 3   1125   1050    hb
## 4    239    350    hb
## 5    701    750    hb
```

```
allbacks %>%
  lm(weight ~ volume + cover, data = .) %>%
  tidy()
```

```
## # A tibble: 3 x 5
##   term        estimate std.error statistic      p.value
##   <chr>          <dbl>     <dbl>     <dbl>        <dbl>
## 1 (Intercept)  198.      59.2         3.34 0.00584
## 2 volume         0.718    0.0615     11.7  0.0000000660
## 3 coverpb     -184.      40.5        -4.55 0.000672
```

Solution:

Three important things to keep in mind:

1. The model describes the line (the prediction or the average) and does **not** describe the points (individual observations).
2. Be very careful to avoid any causal language (like "change" or "increase").
3. The interpretation of the coefficients is while keeping the other variable constant.

- **0.718** Keeping cover type constant, books with one additional cm^3 of volume will be predicted to be 0.718 g heavier than books without one additional cm^3 of volume.
- **-184.05** Keeping volume constant, hardback books are predicted to weight 184.05 g more than books with paper backs.