WU #23

Math 58B, Spring 2023

Thursday, April 20, 2023

Your Name: _____

Names of people you worked with: _____

1. Are you getting enough sleep?

2. After this class, what (if any) kind of math are you looking forward to learning more about?

3. Consider a sample of 15 books (the first 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:

3. Three important things to keep in mind:

- The model describes the line (the prediction or the average) and does **not** describe the points (individual observations).

- Be very careful to avoid any causal language (like "change" or "increase").

- 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.