Interaction Activity

Computational Lab The purpose of this activity is to better understand an interaction model.

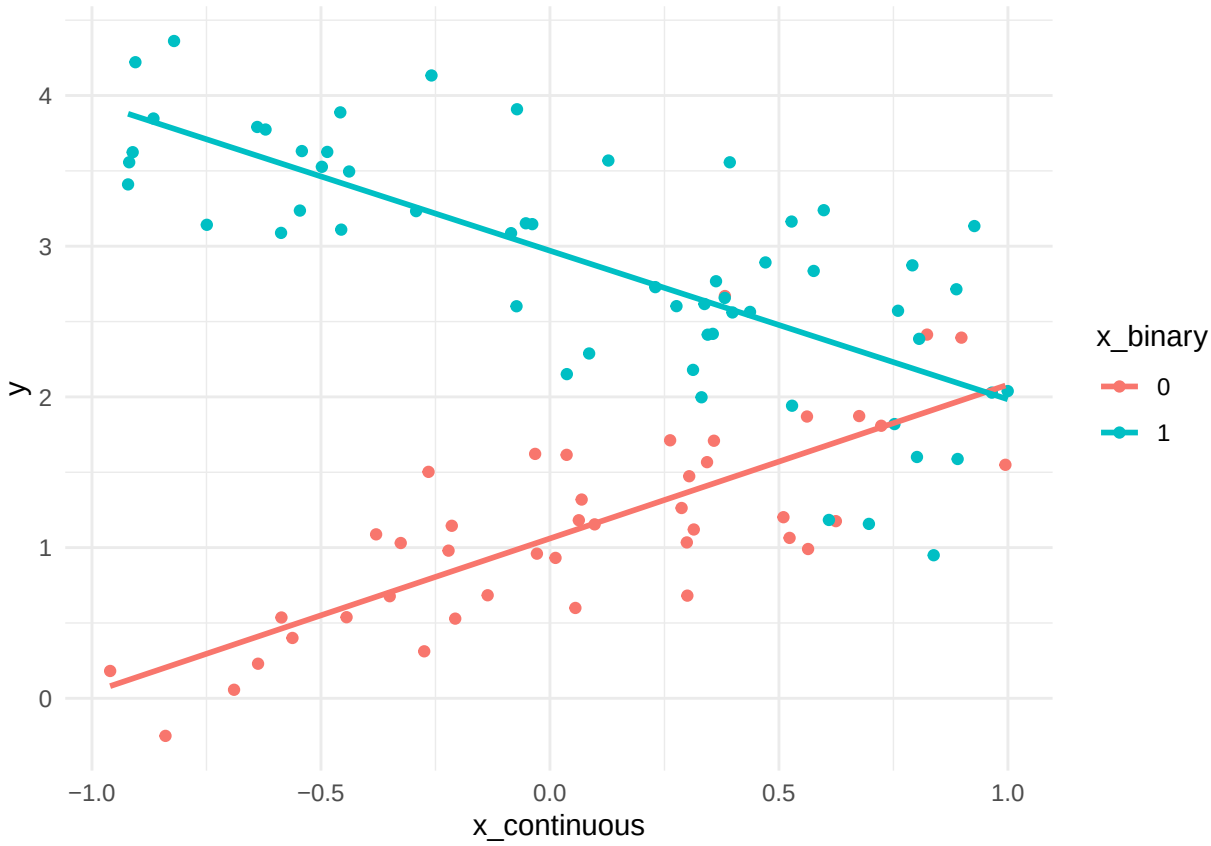
1. Simulate fake data that has an interaction.

```
n <- 100
fake_data <- tibble( x_binary = rbinom(n, 1, .5),
             x_continuous = runif(100, -1, 1))

beta <- c(1, 2, 1, -2)
sigma <- .5

fake_data <- fake_data %>%
  mutate(y =  rnorm(n, mean = beta[1] + x_binary *
                      beta[2] + x_continuous * beta[3] + x_continuous * x_binary * beta[4],
         sd = sigma)) %>% mutate(x_binary =factor(x_binary))
```

2. Visualize the interaction.

```
fake_data %>% ggplot(aes(y=y, x=x_continuous, color = x_binary)) + geom_point() + geom_smooth(method =
  theme_minimal()
```

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



3. Fit interaction model.

```
stan_glm(y ~ x_binary * x_continuous, data = fake_data, refresh = 0)
```

```
## stan_glm
##  family:       gaussian [identity]
##  formula:      y ~ x_binary * x_continuous
##  observations: 100
##  predictors:   4
## ------
##                        Median MAD_SD
## (Intercept)             1.1    0.1
## x_binary1               1.9    0.1
## x_continuous            1.0    0.2
## x_binary1:x_continuous -2.0    0.2
##
## Auxiliary parameter(s):
##       Median MAD_SD
## sigma 0.5    0.0
##
## ------
## * For help interpreting the printed output see ?print.stanreg
## * For info on the priors used see ?prior_summary.stanreg
```