Homework 3

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```r
# libraries
library(tidyverse)
library(ggplot2)

# setup plot theme
theme_set(
  theme_bw() +
    theme(legend.position = "top")
  )

###CODE FOR HW3#####
set.seed(124)
n <- 16
p_C <- 1/5
C <- rbinom(n,1,p_C)
theta0 <- 1/2
theta1 <- -1/5
p_A <- theta0+theta1*C
A <- rbinom(n,1,p_A)
beta0 <- 110
beta1 <- 20
beta2 <- 5
sigma_Y <- 1
mu_Y <- beta0+beta1*C+beta2*A
Y <- rnorm(n,mu_Y, sigma_Y)
```

1. Interpret parameters

2. PACE

3. g-formula (randomized vs. observational study)

4. Estimate and confidence interval of $E[Y|A=1] - E[Y|A=0]$

5. Estimate and confidence interval of $E[Y_1] - E[Y_0]$

6. Assumptions of estimate $E[Y_1] - E[Y_0]$ using linear regression