```
library(ggplot2)
library(tidyverse)
library(haven)

setwd("C:/Users/Michael/Desktop/ECON/Lab 6")
load("ACS_2021_couples.RData")

summary(acs2021_couples$RELATE)

## limiting analysis to spouses only
acs2021_spouses <- acs2021_couples %>%
  filter(RELATE == "Spouse")

acs2021_spouses$age_diff <- acs2021_spouses$AGE - acs2021_spouses$h_age

summary(acs2021_spouses$age_diff[(acs2021_spouses$SEX ==
"Female")&(acs2021_spouses$h_sex == "Male")])
summary(acs2021_spouses$age_diff[(acs2021_spouses$SEX == "Male")&(acs2021_spouses$h_sex
== "Female")])
summary(acs2021_spouses$age_diff[(acs2021_spouses$SEX == "Male")&(acs2021_spouses$h_sex
== "Male")])
summary(acs2021_spouses$age_diff[(acs2021_spouses$SEX ==
"Female")&(acs2021_spouses$h_sex == "Female")])

summary(acs2021_spouses$AGE[(acs2021_spouses$SEX == "Female")&(acs2021_spouses$h_sex
== "Male")])
summary(acs2021_spouses$h_age[(acs2021_spouses$SEX == "Female")&(acs2021_spouses$h_sex
== "Male")])

acs2021_spouses$educ_numeric <- fct_recode(acs2021_spouses$EDUC,
                                  "0" = "N/A or no schooling",
                                  "2" = "Nursery school to grade 4",
                                  "6.5" = "Grade 5, 6, 7, or 8",
                                  "9" = "Grade 9",
                                  "10" = "Grade 10",
                                  "11" = "Grade 11",
                                  "12" = "Grade 12",
                                  "13" = "1 year of college",
                                  "14" = "2 years of college",
                                  "15" = "3 years of college",
                                  "16" = "4 years of college",
                                  "17" = "5+ years of college")
acs2021_spouses$educ_numeric <-
as.numeric(levels(acs2021_spouses$educ_numeric))[acs2021_spouses$educ_numeric]
acs2021_spouses$h_educ_numeric <- fct_recode(acs2021_spouses$h_educ,
                                    "0" = "N/A or no schooling",
                                    "2" = "Nursery school to grade 4",
```

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                                    "6.5" = "Grade 5, 6, 7, or 8",
                                    "9" = "Grade 9",
                                    "10" = "Grade 10",
                                    "11" = "Grade 11",
                                    "12" = "Grade 12",
                                    "13" = "1 year of college",
                                    "14" = "2 years of college",
                                    "15" = "3 years of college",
                                    "16" = "4 years of college",
                                    "17" = "5+ years of college")
acs2021_spouses$h_educ_numeric <-
as.numeric(levels(acs2021_spouses$h_educ_numeric))[acs2021_spouses$h_educ_numeric]
acs2021_spouses$educ_diff <- acs2021_spouses$educ_numeric -
acs2021_spouses$h_educ_numeric

acs_subgroup <- acs2021_spouses %>% filter((AGE >= 25) & (AGE <= 55) &
                                     (LABFORCE == 2)
                                    & (WKSWORK2 > 4)
                                    & (UHRSWORK >= 35) )

library(AER)

m1 <- lm(age_diff ~ educ_diff,
        data = acs2021_spouses)

m2 <- lm(age_diff ~ educ_diff + I(educ_diff^2) + I(educ_diff^3),
        data = acs2021_spouses)

coeftest(m1, vcov = vcovHC)

waldtest(m1, m2, vcov = vcovHC)

library(modelsummary)

models <- list(
  "M 1" = lm(age_diff ~ educ_diff, data = acs2021_spouses),
  "M 2" = lm(age_diff ~ educ_diff + I(educ_diff^2) + I(educ_diff^3), data = acs2021_spouses) )

modelsummary(models, stars = TRUE)

##Analysis:
##For each additional year of education the respondent has over their spouse, the respondent tends to
be 0.063 years younger than their spouse
##More educated partners tend to be slightly younger in the relationship
##As education gaps get larger (in either direction), the age difference becomes more pronounced
##The R² of 0.001 means education difference explains very little of age difference variance
```

	M 1	M 2
+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001		
(Intercept)	-0.487***	-0.453***
	(0.007)	(0.007)
educ_diff	-0.063***	-0.084***
	(0.003)	(0.004)
I(educ_diff^2)		-0.005***
		(0.000)
I(educ_diff^3)		0.000***
		(0.000)
Num.Obs.	647454	647454
R2	0.001	0.001
R2 Adj.	0.001	0.001
AIC	4022614.6	4022319.6
BIC	4022648.7	4022376.5
Log.Lik.	-2011304.288	-2011154.778
F	605.510	301.625
RMSE	5.41	5.40