Homework 6

In this exercise, we will consider the entry of the Fox News Channel into the television market in the late 1990s. This exercise is based on the following study: Stefano DellaVigna and Ethan Kaplan (2007). "The Fox News Effect: Media Bias and Voting." *Quarterly Journal of Economics*, 122:3, pp.1187-1234.

Note that due to the nature of negotiations between cable companies and television networks, adding a new channel to the line-up of a cable company may take a long time. For this reason, in contrast to what many people might expect, FoxNews was not able to enter conservative media markets first. We will be looking at some of the differences between the towns that initially did not receive FoxNews, and those that did. The data set is in the csv file `foxnews.csv`. It contains information for 10,126 towns across 28 states in the United States:

Loading the data

```
foxnews <- read.csv("foxnews.csv", stringsAsFactors = FALSE)
```

Name	Description
town	Town name
state	State in which the town is located
subrf2000	Share of Fox News subscribers in 2000
gopvoteshare2000	Two-party vote share for the Republicans (2000 Presidential election)
gopvoteshare1996	Two-party vote share for the Republicans (1996 Presidential election)
gopvoteshare1992	Two-party vote share for the Republicans (1992 Presidential election)
college1990	Proportion of population with a college degree in 1990
male1990	Proportion of male population in 1990
black1990	Proportion of black population in 1990
hisp1990	Proportion of Hispanic population in 1990
income1990	Median income in 1990
logincome1990	Median income in 1990 on the logarithmic scale

Question 1

1.1. We first want to know about differences between towns with and without Fox News in 2000. What is the mean difference in the median income for towns with and without Fox News?

We need to create a variable called `foxified` that is equal to 1 when the value `subrf2000` is greater than 0 and that is equal to 0 when `subrf2000` is equal to zero or when `subrf2000` is NA.

```
foxnews$foxified <- 0
foxnews$foxified[foxnews$subrf2000 > 0] <- 1

round(mean(foxnews$income1990[foxnews$foxified == 1]) - mean(foxnews$income1990[foxnews$foxi
    0]), 2)
```

```
[1] 0.36
```

Answer: .36

1.2. What was the mean difference in the proportion of residents with college degrees in towns with and without Fox News?

```
round(mean(foxnews$college1990[foxnews$foxified == 1]) - mean(foxnews$college1990[foxnews$fo
    0]), 2)
```

```
[1] 0.03
```

Answer: .03

1.3. What was the mean difference in the proportion of non-white residents in towns with and without Fox News?

```
foxnews$nonwhite <- foxnews$black1990 + foxnews$hisp1990

round(mean(foxnews$nonwhite[foxnews$foxified == 1]) - mean(foxnews$nonwhite[foxnews$foxified
    0]), 2)
```

```
[1] 0
```

Answer: 0

1.4. Was there a difference in the proportion of citizens voting with the GOP in towns with and without Fox News? (Use the 1992 vote share)

```
round(mean(foxnews$gopvoteshare1992[foxnews$foxified == 1], na.rm = T) -
    mean(foxnews$gopvoteshare1992[foxnews$foxified == 0], na.rm = T),
    2)
```

```
[1] 0.02
```

Answer: .02

1.5. What does this tell us?

All differences are very small, which suggests that town with and without fox news are rather similar.

Question 2

2.1. Now let's consider the relationship between exposure to Fox News and change in the GOP's vote share from 1996 to 2000. Create a new variable that measures the difference between the Republican vote share in 2000 and in 1996 (call it foxnews$voteshare.diff). Compute the relationship between this new variable and **subrf2000** using regression and **voteshare.diff** as the dependent measure. What is the coefficient for subrf2000?

```
foxnews$voteshare.diff <- foxnews$gopvoteshare2000 - foxnews$gopvoteshare1996

lm(voteshare.diff ~ subrf2000, data = foxnews)
```

```
Call:
lm(formula = voteshare.diff ~ subrf2000, data = foxnews)

Coefficients:
(Intercept)     subrf2000
    0.07133      -0.03735
```

Answer: -.04

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Question 3

3.1. Now consider the effect of GOP vote share in 1992 on getting Fox News. Using `gopvoteshare1992` as the independent measure and `subrf2000` as the dependent measure run a linear regression. What is the coefficient for `gopvoteshare1992`

```
lm(subrf2000 ~ gopvoteshare1992, data = foxnews)
```

```
Call:
lm(formula = subrf2000 ~ gopvoteshare1992, data = foxnews)

Coefficients:
    (Intercept)   gopvoteshare1992
        0.01105            0.08968
```

Answer: .09

3.2. From this regression what would we expect for `subrf2000` if `gopvoteshare1992` is equal to .34

```
round(0.01105 + (0.34 * 0.08968), 2)
```

```
[1] 0.04
```

Answer: .04

3.3. Let's add additional variables to the regression to account for other town-level differences. Add: `college1990`, `male1990`, `black1990`, `hisp1990` and `logincome1990`.

```
lm(subrf2000 ~ gopvoteshare1992 + college1990 + male1990 + black1990 +
    hisp1990 + logincome1990, data = foxnews)
```

```
Call:
lm(formula = subrf2000 ~ gopvoteshare1992 + college1990 + male1990 +
    black1990 + hisp1990 + logincome1990, data = foxnews)

Coefficients:
    (Intercept)   gopvoteshare1992        college1990           male1990
      0.0349636          0.0902933          0.0255931         -0.0773728
       black1990           hisp1990      logincome1990
      0.0274797          0.0003155          0.0100853
```

3.4. Now compute the expected value of `subrf2000` for the following "town"

Variable	Value
gopvoteshare1992	.76
college1990	.15
male1990	.51
black1990	.01
hisp1990	.05
logincome1990	.93

```
round(0.0349636 + (0.0902933 * 0.76) + (0.0255931 * 0.15) + (-0.0773728 *
    0.51) + (0.0274797 * 0.01) + (0.0003155 * 0.05) + (0.0100853 *
    0.93), 2)
```

```
[1] 0.08
```

Answer: .08

Question 4

4.1. Estimate the causal effect of Fox News on Republicans vote share. We will do this with a Difference-in-Differences estimator. Find the difference in mean `voteshare.diff` for towns with and without Fox News.

```
DiD.treat <- mean(foxnews$voteshare.diff[foxnews$foxified ==
    1], na.rm = TRUE)
DiD.control <- mean(foxnews$voteshare.diff[foxnews$foxified ==
    0], na.rm = TRUE)

DiD <- DiD.treat - DiD.control
round(DiD, 2)
```

```
[1] -0.01
```

Answer: -.01

Question 5

5.1. Perhaps just measuring if Fox News exists is not a sufficient measure of the effect of Fox News on votes. Let's account for the level of exposure to Fox in each town. Divide towns that received Fox News into three equal groups based on their share of Fox News subscribers. Among the towns who received Fox News, the 'high exposure' group represents the group of towns whose share of subscribers is greater than or equal to the 66 percentile (among those who received Fox News). In contrast, the 'low exposure' group represents the group of towns whose share of subscribers is less than or equal to the 33 percentile (among those who received Fox News).

Compare the change in vote share between those in the 'high exposure' group to the 'low exposure' group.

```
p33 <- quantile(foxnews$subrf[foxnews$subrf > 0], probs = c(0.33),
    na.rm = T)

p66 <- quantile(foxnews$subrf[foxnews$subrf > 0], probs = c(0.66),
    na.rm = T)

round(mean(foxnews$voteshare.diff[foxnews$subrf >= p66], na.rm = T) -
    mean(foxnews$voteshare.diff[foxnews$subrf <= p33], na.rm = T),
    2)
```

```
[1] -0.02
```

Answer: -.02

5.2. Interpret your result

This serves as a further check on the validity of our analysis, confirming the earlier conclusion that exposure to Fox News marginally reduced the Republicans' share of the vote in the 2000 Presidential election, as compared with the 1996 election.

Question 6

6.1. Consider the effect of having access to Fox News (as measured by `foxified`) on the Republican vote share for each state. Repeat the analysis done in Question 4 (comparing towns with and without Fox News) for each state, but do it for each state. You will compute a state-specific estimate of the Fox News effect (remember not all states are in the dataset). In how many states was the difference positive? In how many was it negative?

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```
by_state_foxified <- tapply(foxnews$voteshare.diff[foxnews$foxified ==
    1], foxnews$state[foxnews$foxified == 1], mean, na.rm = T)
by_state_not_foxified <- tapply(foxnews$voteshare.diff[foxnews$foxified ==
    0 & foxnews$state != "Nh"], foxnews$state[foxnews$foxified ==
    0 & foxnews$state != "Nh"], mean, na.rm = T)

# must delete new hampshire!
table(by_state_foxified - by_state_not_foxified > 0)
```

```
FALSE   TRUE
   18      9
```

Answer (positive): 9 Answer (negative): 18

6.2. Interpret your results.

The effect was not the same across states. Some states experienced an increase in vote share in favor of the Republicans (Alabama, Hawaii, North Dakota, Vermont), while for some other states like California, New York, and Wyoming, the effect was really small. The rest of the states experienced a decrease in their support for the Republicans. Note that in the case of New Hampshire, there are only towns in the control group, which makes it not possible to estimate the effect of Fox News on the Republicans' vote share.