Problemset 5

In this exercise, we will analyze the relationship between various demographic traits and pro-feminist voting behavior among circuit court judges. In a recent paper, Adam N. Glynn and Maya Sen argue that having a female child causes circuit court judges to make more pro-feminist decisions. The paper can be found at:

Glynn, Adam N., and Maya Sen. (2015). "Identifying Judicial Empathy: Does Having Daughters Cause Judges to Rule for Women's Issues?." *American Journal of Political Science* Vol. 59, No. 1, pp. 37–54.

The dataset `dbj.csv` contains the following variables about individual judges:

Name	Description
`name`	The judge's name
`child`	The number of children each judge has.
`circuit.1`	Which federal circuit the judge serves in.
`girls`	The number of female children the judge has.
`progressive.vote`	The proportion of the judge's votes on women's issues which were decided in a pro-feminist direction.
`race`	The judge's race (`1` = white, `2` = African-American, `3` = Hispanic, `4` = Asian-American).
`religion`	The judge's religion (`1` = Unitarian, `2` = Episcopalian, `3` = Baptist, `4` = Catholic, `5` = Jewish, `7` = Presbyterian, `8` = Protestant, `9` = Congregationalist, `10` = Methodist, `11` = Church of Christ, `16` = Baha'i, `17` = Mormon, `21` = Anglican, `24` = Lutheran, `99` = unknown).
`republican`	Takes a value of `1` if the judge was appointed by a Republican president, `0` otherwise. Used as a proxy for the judge's party.
`sons`	The number of male children the judge has.
`woman`	Takes a value of `1` if the judge is a woman, `0` otherwise.
`yearb`	The year the judge was born.

```
children <- read.csv("children.csv")
```

Round all results to two decimal places

Question 1

1.1. What proportion of the justices in the dataset are male republicans?

```
# Subset for male republicans
male_republicans <- children[children$republican == 1 & children$woman == 0, ]

# Calculate the proportion
proportion_male_republicans <- nrow(male_republicans) / nrow(children)

# Print the proportion
proportion_male_republicans
```

```
## [1] 0.4910714
```

```
# or

# Subset for male republicans
male_republicans <- children[children$republican == 1 & children$woman == 0, ]

# Calculate the proportion
proportion_male_republicans <- nrow(male_republicans) / nrow(children)

# Print the proportion
proportion_male_republicans
```

```
## [1] 0.4910714
```

Answer: .49

1.2. Opposition to abortion is often high among those who identify as Baptist or Catholic. How much less on average do justices who follow these religions support women's issues less often than the average for all other justices?

```
# Subset for Baptist and Catholic justices
bc_justices <- children[children$religion == 3 | children$religion == 4, ]

# Subset for justices not Baptist or Catholic
other_justices <- children[children$religion != 3 & children$religion != 4, ]

# Calculate the averages
average_bc = mean(bc_justices$progressive.vote, na.rm = TRUE)
average_others = mean(other_justices$progressive.vote, na.rm = TRUE)

# Output the results
average_bc
```

```
## [1] 0.4129911
```

```
average_others
```

```
## [1] 0.4444991
```

```
# Compare the averages
average_bc - average_others
```

```
## [1] -0.03150808
```

Answer: -0.03

1.3. We want to describe the demographics in this dataset. What proportion of justices are male? How many sons does the average justice have? How many daughters does the average justice have? When was the average justice born? What proportion of justices are non-Christian (Jewish or Baha'i)?

```r
# Calculate the proportion of male justices
proportion_male <- mean(children$woman == 0, na.rm = TRUE)

# Calculate the average number of sons per justice
average_sons <- mean(children$sons, na.rm = TRUE)

# Calculate the average number of daughters per justice
average_daughters <- mean(children$girls, na.rm = TRUE)

# Calculate the average birth year of justices
average_yearb <- mean(children$yearb, na.rm = TRUE)

# Calculate the proportion of non-Christian justices (Jewish or Baha'i)
proportion_non_christian <- mean((children$religion == 5 | children$religion == 16), na.rm = TRUE)

# Print results
cat("Proportion of male justices:", proportion_male, "\n",
    "Average number of sons:", average_sons, "\n",
    "Average number of daughters:", average_daughters, "\n",
    "Average birth year of justices:", average_yearb, "\n",
    "Proportion of non-Christian justices:", proportion_non_christian, "\n")
```

```
## Proportion of male justices: 0.8303571
##  Average number of sons: 1.236607
##  Average number of daughters: 1.236607
##  Average birth year of justices: 1934.879
##  Proportion of non-Christian justices: 0.1696429
```

Proportion of male justices: 0.83 Average number of sons: 1.24 Average number of daughters: 1.24 Average birth year of justices: 1934.88 Proportion of non-Christian justices: 0.17

1.4. What is the mean difference in support for women's issues for Democratic and Republican justices?

```r
# Calculate the mean progressive vote for Republican justices
mean_republican = mean(children$progressive.vote[children$republican == 1], na.rm = TRUE)

# Calculate the mean progressive vote for Democratic justices
mean_democratic = mean(children$progressive.vote[children$republican == 0], na.rm = TRUE)

# Calculate the mean difference
mean_difference = mean_democratic - mean_republican

# Print the result
mean_difference
```

```
## [1] 0.110029
```

Answer: .11

1.5. How many justices always support progressive outcomes for women's issues and how many always oppose the progressive outcome?

```r
# Assume each row in children represents a unique justice's typical voting behavior
voting_patterns = table(children$progressive.vote)

# Identify justices who always support progressive outcomes (progressive.vote = 1)
always_support = voting_patterns["1"]

# Identify justices who always oppose progressive outcomes (progressive.vote = 0)
always_oppose = voting_patterns["0"]

# Print the results
cat("Number of justices who always support progressive outcomes:", always_support, "\n",
    "Number of justices who always oppose progressive outcomes:", always_oppose, "\n")
```

```
## Number of justices who always support progressive outcomes: 14
##  Number of justices who always oppose progressive outcomes: 17
```

Number of justices who always support progressive outcomes: 14 Number of justices who always oppose progressive outcomes: 17

Question 2

2.1. Create a new binary variable which takes a value of `1` if a judge has *at least* one child (that is, any children at all), `0` otherwise. Then, use this variable to answer the following questions. What is the difference in the proportion of Republicans and Democrats who have at least one child?

```r
# Create the binary variable for having at least one child
children$has_child <- as.integer(children$child > 0)

# Create a contingency table for the 'has_child' and 'republican' variables
parental_status_by_party <- table(children$has_child, children$republican)

# Calculate proportions of judges with at least one child for each party
prop_parent_by_party <- prop.table(parental_status_by_party, margin = 2)

# Calculate the difference in proportions
difference_in_proportions <- prop_parent_by_party[2, 1] - prop_parent_by_party[2, 2]

# Output the difference
difference_in_proportions
```

```
## [1] -0.009066838
```

Answer: -.01

2.2. How different, on average, are judges with children than judges without children on women's issues?

```r
# Mean progressive vote for judges with at least one child
mean_with_children = mean(children$progressive.vote[children$has_child == 1], na.rm = TRUE)

# Mean progressive vote for judges without children
mean_without_children = mean(children$progressive.vote[children$has_child == 0], na.rm = TRUE)
```

```r
# Calculate the difference
difference_in_means = mean_with_children - mean_without_children

# Output the difference
difference_in_means
```

```
## [1] -0.02474924
```

Answer: -0.02

2.3. How different, on average, are Republican and Democratic parents votes on feminist issues?

```r
# Filter the dataset for parents who are Republican
republican_parents_votes = children$progressive.vote[children$republican == 1 & children$has_child == 1]

# Filter the dataset for parents who are Democratic
democratic_parents_votes = children$progressive.vote[children$republican == 0 & children$has_child == 1]

# Calculate the mean progressive vote for Republican parents
mean_republican_parents = mean(republican_parents_votes, na.rm = TRUE)

# Calculate the mean progressive vote for Democratic parents
mean_democratic_parents = mean(democratic_parents_votes, na.rm = TRUE)

# Calculate the difference in means
difference_in_means = mean_democratic_parents - mean_republican_parents

# Output the difference
difference_in_means
```

```
## [1] 0.1219854
```

Answer: 0.12

Question 3

3.1. What is the difference in the proportion of pro-feminist decisions between judges who have at least one daughter and those who do not have any?

```r
# Create binary variable for having at least one daughter
children$has_daughter <- as.integer(children$girls > 0)

# Calculate the proportion of pro-feminist decisions for judges with at least one daughter
proportion_with_daughter = mean(children$progressive.vote[children$has_daughter == 1], na.rm = TRUE)

# Calculate the proportion of pro-feminist decisions for judges without any daughters
proportion_without_daughter = mean(children$progressive.vote[children$has_daughter == 0], na.rm = TRUE)

# Calculate the difference in proportions
difference_in_proportions = proportion_with_daughter - proportion_without_daughter

# Output the difference
difference_in_proportions
```

```
## [1] 0.06399255
```

Answer: 0.06

Question 4

4.1. Use a linear regression model with `progressive.vote` as the dependent variable and `yearb`, `girls` and `republican` as independent variables.

```
# Fit a linear regression model
lm(progressive.vote ~ yearb + girls + republican, data = children)
```

```
##
## Call:
## lm(formula = progressive.vote ~ yearb + girls + republican, data = children)
##
## Coefficients:
## (Intercept)        yearb        girls   republican
##   1.7970045   -0.0006843    0.0157918   -0.1081742
```

4.2. What proportion of votes in support of women's issues would we predict for a Democrat with 3 girls who was born in 1956.

```
round(1.7970045  + -0.0006843*(1956) + 0.0157918*(3) + -0.1081742 *(0),2)
```

```
## [1] 0.51
```

Answer: .51

4.3. What proportion of votes in support of women's issues would we predict for a Democrat with no girls who was born in 1987.

```
round(1.7970045  + -0.0006843*(1987) + 0.0157918*(0) + -0.1081742 *(0),2)
```

```
## [1] 0.44
```

Answer: .44