ASSIGNMENT 5

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Set the working directory to the root of your DSC 520 directory

setwd("/Users/nbaga/dsc520")

Load the 'data/r4ds/heights.csv

```
heights_df <- read.csv("/Users/nbaga/dsc520/data/r4ds/heights.csv")

## Using `cor()` compute correclation coefficients for
## height vs. earn
cor(heights_df$height, heights_df$earn, method = "pearson")
```

```
## [1] 0.2418481
```

```
### age vs. earn
cor(heights_df$age, heights_df$earn, method = "pearson")
```

```
## [1] 0.08100297
```

```
### ed vs. earn
cor(heights_df$ed, heights_df$earn, method = "pearson")
```

```
## [1] 0.3399765
```

```
## Spurious correlation
## The following is data on US spending on science, space, and technology in millions of today's dollar
## and Suicides by hanging strangulation and suffocation for the years 1999 to 2009
## Compute the correlation between these variables
tech_spending <- c(18079, 18594, 19753, 20734, 20831, 23029, 23597, 23584, 25525,27731, 29449)
suicides <- c(5427, 5688, 6198, 6462, 6635, 7336, 7248, 7491, 8161, 8578, 9000)
cor(tech_spending, suicides)
```

```
## [1] 0.9920817
```

```
##Student Survey

##The survey data is located in this StudentSurvey.csv file.

## I) Use R to calculate the covariance of the Survey variables and provide an explanation of why you w

student_survey <- read.csv("/Users/nbaga/dsc520/data/student-survey.csv")

 ## 1) Time Reading vs Happiness:-

cov(as.numeric(student_survey$TimeReading),as.numeric(student_survey$Happiness), method = "pearson")
```

```
## [1] -10.35009
```

```
  ## Expalantion of result:-

   ## The Timereading and Happiness negatively related, in other words , when the       Time of reading

##  2) Time TV vs  Happiness
    cov(as.numeric(student_survey$TimeTV),as.numeric(student_survey$Happiness), method = "pearson")
```

```
## [1] 114.3773
```

```
    ##Explanation :-

       ##The TimeTV and Happiness positively ralted, when TV time increased the
       ## happiness is increased.

## 3) Time TV vs  TimeReading
     cov(as.numeric(student_survey$TimeTV),as.numeric(student_survey$TimeReading), method = "pearson")
```

```
## [1] -20.36364
```

```
    ##  EXplanation:-

         ## TimeTV and TimeReading are negatively related, when ever people watch
         ## more tv theor reading habbit is reduce.


 ## II) Examine the Survey data variables. What measurement is being used for the variables? Explain wh
     ## Explanation

        ## The measurement is used for the 3 variables Time TV in minutes and  TimeReading in hours and

## III) Choose the type of correlation test to perform, explain why you chose this test, and make a pre

     ##EXPLANATION

     ##relationship between two variables is to use the Pearson correlation coefficient,   which is a m

## -1 indicates a perfectly negative linear correlation between two variables
```

```
## 0 indicates no linear correlation between two variables
## 1 indicates a perfectly positive linear correlation between two variables

##Perform a correlation analysis of:
   ## 1)All variables
          cor(student_survey)
```

```
##             TimeReading       TimeTV  Happiness       Gender
## TimeReading  1.00000000 -0.883067681 -0.4348663 -0.089642146
## TimeTV      -0.88306768  1.000000000  0.6365560  0.006596673
## Happiness   -0.43486633  0.636555986  1.0000000  0.157011838
## Gender      -0.08964215  0.006596673  0.1570118  1.000000000
```

```
   ## 2) A single correlation between two a pair of the variables
          cor(student_survey$TimeReading,student_survey$TimeTV)
```

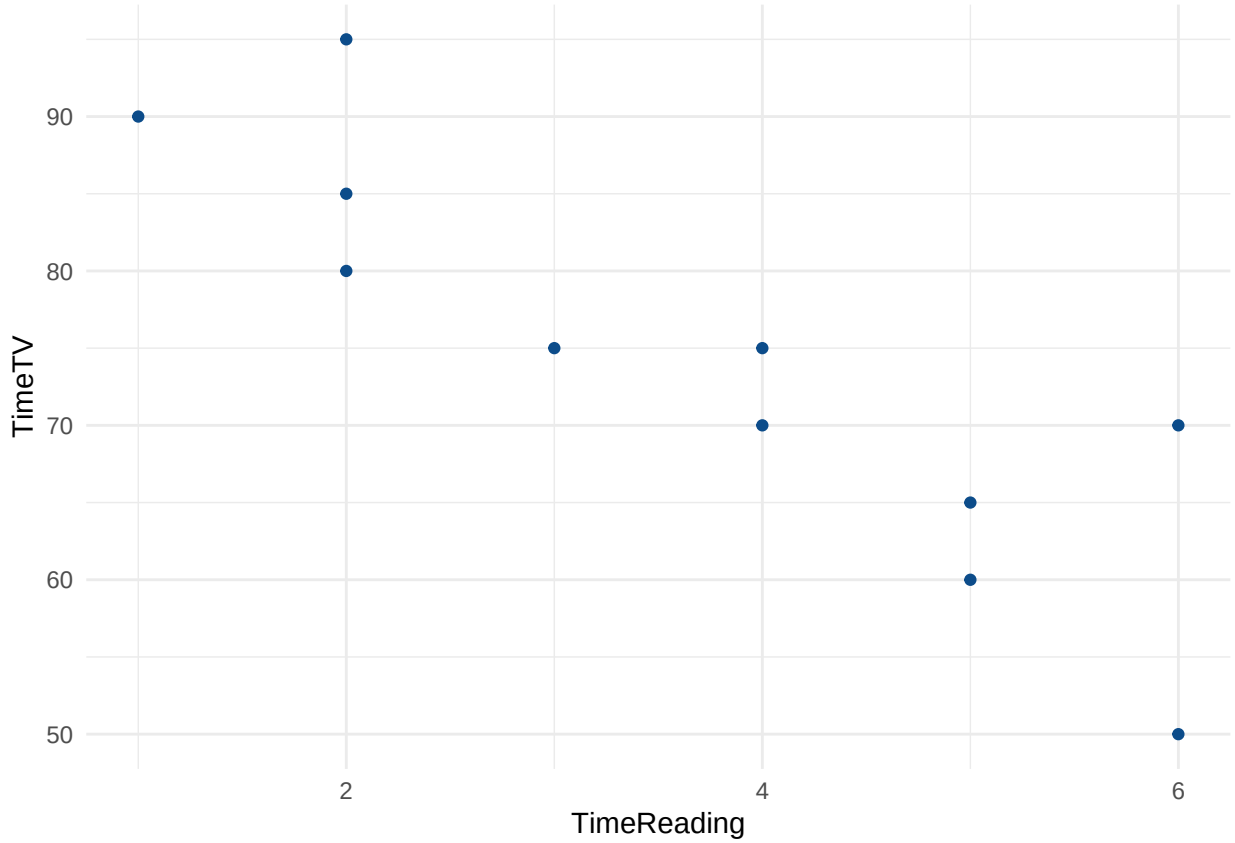
```
## [1] -0.8830677
```

```
   ## 3) Repeat your correlation test in step 2 but set the confidence interval at 99%
          cor.test(student_survey$TimeReading,student_survey$TimeTV,conf.level=0.99)
```

```
##
##  Pearson's product-moment correlation
##
## data:  student_survey$TimeReading and student_survey$TimeTV
## t = -5.6457, df = 9, p-value = 0.0003153
## alternative hypothesis: true correlation is not equal to 0
## 99 percent confidence interval:
##  -0.9801052 -0.4453124
## sample estimates:
##        cor
## -0.8830677
```

```
   ## 4) Describe what the calculations in the correlation matrix suggest about the relationship betwee
          ## Explanation:-
          ## Based on the calculation found that the 99 percent confidence
          ## interval for the variables taken are : ##  -0.9801052 -0.4453124
          ## and the T-Value is t = -5.6457 and the p-value = 0.0003153 and the
          ## sample correlation is -0.8830677 whcih means the variables are
          ## negitively related
          ## variable increases the other one decreases and if one decreases the other one increase as

   ## 5) Calculate the correlation coefficient and the coefficient of determination, describe what you
library(ggplot2)
        ggplot(student_survey) +  aes(x = TimeReading, y = TimeTV) +  geom_point(colour = "#0c4c8a") +
  theme_minimal()
```




```
   ## 6) Based on your analysis can you say that watching more TV caused students to read less? Explain
        ##Explanation

        ##Yes, Based on the analysis we can conclude that watching TV more is causing less in reading.

   ## 7) Pick three variables and perform a partial correlation, documenting which variable you are "co
        library(ppcor)
```

```
## Loading required package: MASS
```

```
        pcor(student_survey)
```

```
## $estimate
##             TimeReading     TimeTV Happiness     Gender
## TimeReading   1.0000000 -0.8827973 0.4013124 -0.2706036
## TimeTV       -0.8827973  1.0000000 0.6311611 -0.2943135
## Happiness     0.4013124  0.6311611 1.0000000  0.2833152
## Gender       -0.2706036 -0.2943135 0.2833152  1.0000000
##
## $p.value
##             TimeReading      TimeTV  Happiness    Gender
## TimeReading 0.000000000 0.001615344 0.28437887 0.4812716
## TimeTV      0.001615344 0.000000000 0.06832112 0.4420392
## Happiness   0.284378868 0.068321119 0.00000000 0.4600603
## Gender      0.481271572 0.442039185 0.46006033 0.0000000
```

```
##
## $statistic
##             TimeReading     TimeTV Happiness     Gender
## TimeReading   0.0000000 -4.9720962 1.1592148 -0.7436966
## TimeTV       -4.9720962  0.0000000 2.1528933 -0.8147673
## Happiness     1.1592148  2.1528933 0.0000000  0.7816064
## Gender       -0.7436966 -0.8147673 0.7816064  0.0000000
##
## $n
## [1] 11
##
## $gp
## [1] 2
##
## $method
## [1] "pearson"
```

```
      ## From the above analysis , we can conclude that the if one variable is going up another variabl
```