

ASylvest_DSC520_Exercise7.2

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```
##   TimeReading TimeTV Happiness Gender
## 1          1      90     86.20      1
## 2          2      95     88.70      0
## 3          2      85     70.17      0
## 4          2      80     61.31      1
## 5          3      75     89.52      1
## 6          4      70     60.50      1
```

- i. Use R to calculate the covariance of the Survey variables and provide an explanation of why you would use this calculation and what the results indicate.

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

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

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

```
## [1] -0.08181818
```

```
## [1] 0.04545455
```

Answer:

As TimeTV increases, Happiness increases As TimeTV increases, TimeReading decreases As TimeReading increases, Happiness decreases There appears to be 0 correlation between Gender and TimeReading There appears to be 0 correlation between Gender and TimeTV

- ii. Examine the Survey data variables. What measurement is being used for the variables? Explain what effect changing the measurement being used for the variables would have on the covariance calculation. Would this be a problem? Explain and provide a better alternative if needed

Answer:

TimeReading is listed in hours, TimeTV is listed in minutes, Gender is listed in binary, and Happiness is listed as a percentage. I think TimeReading and TimeTV should both be listed in minutes.

- iii. Choose the type of correlation test to perform, explain why you chose this test, and make a prediction if the test yields a positive or negative correlation?

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

Answer:

TVTime and Happiness are positively correlated which means the more time someone spends watching TV, the happier they should be

iv. Perform a correlation analysis of:

1. All variables

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

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

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

```
## [1] -0.08181818
```

```
## [1] 0.04545455
```

2. A single correlation between two a pair of the variables

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

3. Repeat your correlation test in step 2 but set the confidence interval at 99%

```
##  
## Pearson's product-moment correlation  
##  
## data: survey_df$TimeTV and survey_df$TimeReading  
## 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 between the variables. Be specific with your explanation.

Answer:

As TimeTV increases, Happiness increases

As TimeTV increases, TimeReading decreases

As TimeReading increases, Happiness decreases

There appears to be 0 correlation between Gender and TimeReading

There appears to be 0 correlation between Gender and TimeTV

v. Calculate the correlation coefficient and the coefficient of determination, describe what you conclude about the results.

```

##           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

```

Answer:

TimeReading has a negative impact on TimeTV and Happiness

TimeTV has a positive impact on Happiness

Gender does not seem to impact anything

vi. Based on your analysis can you say that watching more TV caused students to read less? Explain.

Answer:

Definitely. The correlation between TimeTV and TimeReading is ~ -0.88 which suggests there is a strong negative correlation between these two variables

vii. Pick three variables and perform a partial correlation, documenting which variable you are “controlling”. Explain how this changes your interpretation and explanation of the results.

```
## [1] 0.762033
```

Answer:

In this instance, Happiness is being controlled. We know that TimeReading and TimeTV have a negative correlation, but when Happiness is controlled the correlation changes for the better.