July 17, 2023

The results below are generated from an R script.

```
setwd('~/Dsc520')
library(ggplot2)
library(readr)
library(dplyr)
library(ppcor)
theUrl <- "http://content.bellevue.edu/cst/dsc/520/id/resources/student-survey.csv"
data <- read.csv(file = theUrl, header =TRUE, sep =',')
dim(data)

## [1] 11  4

#View(data)
as.data.frame(sapply(data,class))

##             sapply(data, class)
## TimeReading             integer
## TimeTV                  integer
## Happiness               numeric
## Gender                  integer

#calculate the covariance of the Survey variables
cov(data)

##              TimeReading       TimeTV  Happiness      Gender
## TimeReading   3.05454545 -20.36363636 -10.350091 -0.08181818
## TimeTV      -20.36363636 174.09090909 114.377273  0.04545455
## Happiness   -10.35009091 114.37727273 185.451422  1.11663636
## Gender       -0.08181818   0.04545455   1.116636  0.27272727

#calculate the correlation among variable in raw data set
# between time reading and Time TV
Cor_read_TV <- cor(data$TimeReading, data$TimeTV, use = "everything", method = c("pearson", "kendall", '
Cor_read_TV

## [1] -0.8830677

cor.test(data$TimeReading, data$TimeTV, method = c("pearson"), conf.level = 0.99)

##
##  Pearson's product-moment correlation
##
## data:  data$TimeReading and data$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

#calculate coefficient of determination
CD_read_TV <- Cor_read_TV^2
CD_read_TV

## [1] 0.7798085

# between time reading and Happiness
cor_read_happy <- cor(data$TimeReading, data$Happiness, use = "everything", method = c("pearson", "kenda
cor_read_happy

## [1] -0.4348663

cor.test(data$TimeReading, data$Happiness, method = c("pearson"), conf.level = 0.99)

##
##  Pearson’s product-moment correlation
##
## data:  data$TimeReading and data$Happiness
## t = -1.4488, df = 9, p-value = 0.1813
## alternative hypothesis: true correlation is not equal to 0
## 99 percent confidence interval:
##  -0.8801821  0.4176242
## sample estimates:
##        cor
## -0.4348663

#calculate coefficient of determination
CD_read_happy <- cor_read_happy^2
CD_read_happy

## [1] 0.1891087

# between time on TV and Happiness
cor_TV_happy <- cor(data$TimeTV, data$Happiness, use = "everything", method = c("pearson", "kendall", "s
cor_TV_happy

## [1] 0.636556

cor.test(data$TimeTV, data$Happiness, method = c("pearson"), conf.level = 0.99)

##
##  Pearson’s product-moment correlation
##
## data:  data$TimeTV and data$Happiness
## t = 2.4761, df = 9, p-value = 0.03521
## alternative hypothesis: true correlation is not equal to 0
## 99 percent confidence interval:
##  -0.1570212  0.9306275
## sample estimates:
##      cor
## 0.636556
```

```
#calculate coefficient of determination
CD_TV_happy <- cor_TV_happy^2
CD_TV_happy
```

```
## [1] 0.4052035
```

```
#on all variables
cor(data[, c(’TimeReading’,’TimeTV’,’Happiness’, ’Gender’)])
```

```
##              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
```

```
#now split data based on gender.
#checking same correlation on male group
data_male <- data %>% filter(Gender == 1)


cor_TV_happy_male <- cor(data_male$TimeTV, data_male$Happiness, use = "everything", method = c("pearson"
cor_TV_happy_male
```

```
## [1] 0.2354574
```

```
CD_TV_Happy_male <- cor_TV_happy_male^2

#checking same correlation on female group
data_female <- data %>% filter(Gender == 0)

cor_TV_happy_female <- cor(data_female$TimeTV, data_female$Happiness, use = "everything", method = c("pe
cor_TV_happy_female
```

```
## [1] 0.8723756
```

```
CD_TV_Happy_female <- cor_TV_happy_female^2

#partial correlation
pcor(data[, c(’Gender’,’TimeTV’,’Happiness’)])
```

```
## $estimate
##                 Gender     TimeTV Happiness
## Gender       1.0000000 -0.1225607 0.1981457
## TimeTV      -0.1225607  1.0000000 0.6435158
## Happiness    0.1981457  0.6435158 1.0000000
##
## $p.value
##                Gender     TimeTV  Happiness
## Gender      0.0000000 0.73588951 0.58317687
## TimeTV      0.7358895 0.00000000 0.04469059
## Happiness   0.5831769 0.04469059 0.00000000
##
## $statistic
##                 Gender     TimeTV Happiness
## Gender       0.0000000 -0.3492872 0.5717776
## TimeTV      -0.3492872  0.0000000 2.3779191
## Happiness  0.5717776  2.3779191 0.0000000
##
## $n
## [1] 11
##
## $gp
## [1] 1
##
## $method
## [1] "pearson"
```

The R session information (including the OS info, R version and all packages used):

```
sessionInfo()

## R version 4.3.1 (2023-06-16 ucrt)
## Platform: x86_64-w64-mingw32/x64 (64-bit)
## Running under: Windows 10 x64 (build 19045)
##
## Matrix products: default
##
##
## locale:
## [1] LC_COLLATE=English_United States.utf8  LC_CTYPE=English_United States.utf8
## [3] LC_MONETARY=English_United States.utf8 LC_NUMERIC=C
## [5] LC_TIME=English_United States.utf8
##
## time zone: America/Chicago
## tzcode source: internal
##
## attached base packages:
## [1] stats     graphics  grDevices utils     datasets  methods   base
##
## other attached packages:
## [1] knitr_1.43    tinytex_0.45  ppcor_1.1     MASS_7.3-60   dplyr_1.1.2   readr_2.1.4
## [7] ggplot2_3.4.2
##
## loaded via a namespace (and not attached):
##  [1] vctrs_0.6.2      cli_3.6.1        xfun_0.39        rlang_1.1.1      highr_0.10
##  [6] generics_0.1.3   glue_1.6.2       colorspace_2.1-0 hms_1.1.3        scales_1.2.1
## [11] fansi_1.0.4      grid_4.3.1       evaluate_0.21    munsell_0.5.0    tibble_3.2.1
## [16] tzdb_0.4.0       lifecycle_1.0.3  compiler_4.3.1   pkgconfig_2.0.3  rstudioapi_0.14
## [21] R6_2.5.1         tidyselect_1.2.0 utf8_1.2.3       pillar_1.9.0     magrittr_2.0.3
## [26] tools_4.3.1      withr_2.5.0      gtable_0.3.3

Sys.time()

## [1] "2023-07-17 22:08:21 CDT"
```