Project 4

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```
# load the packages we need to use
library(knitr)
library(here)

# using the here package
here::here()

## [1] "/Users/heileylee/R scriptfile"
```

Write a function that takes two continuous variables, standardizes each of them, and calculates the Spearman correlation between them for both the un-standardized and standardized variables (the function should return both correlations)

```
# input the data set we require
dat<-read.csv("P4_dat.csv")
# check if there is any NA
sum(is.na(dat))

## [1] 0

# Function of standardization and calculating the Spearman correlation
Corr<-function(x,y){
  x_stand=(x-mean(x))/sd(x)    #standardize x
  y_stand=(y-mean(y))/sd(y)    #standardize y
  cor_unstand=round(cor(x,y,method = "spearman"),3) #calculate the spea
rman correlation for un-standardized variables
  cor_stand=round(cor(x_stand,y_stand,method = "spearman"),3) #calculat
e the spearman correlation for standardized variables
  return(c(cor_unstand,cor_stand)) #return both correlations
}
```

Create a table showing the correlations for each pair

```
# obtain the number of column in the data set
k=ncol(dat)
#  create an empty vector for loop results
table_corr=NULL
# create a FOR loop to get the spearman correlation of each pair in the
 data set
for (i in 1:(k-1)) {
  for (j in (i+1):k) {
    table_corr=rbind(table_corr,c(paste("d",i," and d",j,sep = ""),Corr
```

```
(dat[,i],dat[,j]))
  }
}
# display the result by kable
kable(table_corr,col.name=c("Pair","Un-standardized","Standardized"),ca
ption="# Spearman correlation between each pair for both Un-standardize
d and Standardized variables",align="c")
```

 # Spearman correlation between each pair for both Un-standardized and Standardized variables

Pair	Un-standardized	Standardized
d1 and d2	-0.052	-0.052
d1 and d3	0.155	0.155
d1 and d4	0.032	0.032
d1 and d5	0.016	0.016
d2 and d3	-0.014	-0.014
d2 and d4	0.012	0.012
d2 and d5	0.187	0.187
d3 and d4	0.029	0.029
d3 and d5	-0.093	-0.093
d4 and d5	-0.029	-0.029

Comment on the effect of standardization on Spearman correlation

Based on the result shown in the table, we can easily find that there is no difference between Spearman correlation for un-standardized and standardized variables, which means there is no effect of standardization on Spearman correlation.