Apendix: Source R code

```r
# ---------> complete and run the following code for this assignment  <-------
#
# R code for STA302 or STA1001H1F assignment 1
# copyright by Dogan Akad
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#

## Load in the data set
brain = read.table("/Users/doganakad/Desktop/uoft/first semester/STA302/A1/BrainData.csv",sep=" ",header=T)

## create an indicator for high-IQ (value =1) and low-IQ (value=0)
highIQ = ifelse(brain$FSIQ>=130,1, 0)

## Q1: t-test on MRI count between high- and low IQ groups
t.test(MRIhighIQ, MRIlowIQ)

## Q2: correlation analysis
# cor.test() : missing value is suppressed, default setting:
#      mu = 0, alternative = c("two.sided"),  paired = FALSE,var.equal = FALSE
# - find correlation between MRI count and 3 IQ variables
cor.test(brain$MRIcount, brain$FSIQ)
cor.test(brain$MRIcount, brain$VIQ)
cor.test(brain$MRIcount, brain$PIQ)

# - find correlation between MRI count and 3 IQ variables in high-IQ group
MRIhighIQ <- subset(brain$MRIcount, highIQ == 1)
FSIQhigh <- subset(brain$FSIQ, highIQ == 1)
VIQhigh <- subset(brain$VIQ, highIQ == 1)
PIQhigh <- subset(brain$PIQ, highIQ == 1)

cor.test(MRIhighIQ, FSIQhigh)
cor.test(MRIhighIQ, VIQhigh)
cor.test(MRIhighIQ, PIQhigh)

# - find correlation between MRI count and 3 IQ variables in low-IQ group
MRIlowIQ <- subset(brain$MRIcount, highIQ == 0)
FSIQlow <- subset(brain$FSIQ, highIQ == 0)
VIQlow <- subset(brain$VIQ, highIQ == 0)
PIQlow <- subset(brain$PIQ, highIQ == 0)

cor.test(MRIlowIQ, FSIQlow)
cor.test(MRIlowIQ, VIQlow)
cor.test(MRIlowIQ, PIQlow)

## Q4:
# - Scatterplot of PIG vs MRI count
plot(brain$MRIcount, brain$PIQ, main="PIQ vs MRICount", xlab="MRI count", ylab = "PIQ")

# - find R-square, b0, b1, MSE and p-value for b1 in high-IQ group
linregression <- lm(PIQhigh ~ MRIhighIQ)
linregression$coefficients #b0 and b1
summary(linregression)

# - find R-square, b0, b1, MSE and p-value for b1 in low-IQ group
linregression2 <- lm(PIQlow ~ MRIlowIQ)
linregression2$coefficients #b0 and b1
summary(linregression2)
```