# , Question 2

**Due: Friday 20 September 2019**

**There are places in this assignment where R code will be required. Therefore set the random seed so assignment is reproducible.**

```
set.seed(695281) #Please change random seed to your student id number.
library(dplyr)
```

```
## Warning: package 'dplyr' was built under R version 3.5.2
```

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag
```

```
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

PART A

```
# Read the Dtta
Hiron <- read.csv("Hiron.csv")
HironHomo <- Hiron %>%filter(homc282y==1) %>% select(-idnum)
Hiron <- read.csv("Hiron.csv")
HironWild <- Hiron %>%filter(homc282y==1) %>% select(-idnum)
```

```
#fit linear regression using lm

model <- lm(logsf ~ time,data = HironHomo)
model$coefficients
```

```
## (Intercept)        time
##  4.23987253  0.07126085
```

```
intercept <-matrix(1,length(HironHomo$time),1)

X <- cbind(intercept,HironHomo$time)
XTX <- crossprod(X)
XTXinv <-solve(XTX)
# (XTX)^-1
XTXinv
```

```
##              [,1]          [,2]
## [1,]  0.033734956 -0.0015415009
## [2,] -0.001541501  0.0001062175
```

```
#Estimated error variance
sigma(model)^2
```

```
## [1] 1.715042
```