R Notebook

This is an R Markdown Notebook. When you execute code within the notebook, the results appear beneath the code.

Try executing this chunk by clicking the *Run* button within the chunk or by placing your cursor inside it and pressing *Ctrl+Shift+Enter*.

```
setwd("/Users/grant/Desktop/MIT/2020fall/2020_fall_notes/433_financial_market/Assignment/assignment2")
library("zoo")
```

```
##
## Attaching package: 'zoo'
```

```
## The following objects are masked from 'package:base':
##
##     as.Date, as.Date.numeric
```

```
library("lmtest")
library("sandwich")
x <- data.frame(read.csv("5by5.csv",skip = 15))
x = x[1:1129,]
x <- data.frame(lapply(x, function(x) as.numeric(as.character(x))))
print("test on small szie high B/M")
```

```
## [1] "test on small szie high B/M"
```

```
coeftest(lm(x$SMALL.HiBM ~ 1), vcov. = NeweyWest(lm(x$SMALL.HiBM ~ 1), lag = 6))
```

```
##
## t test of coefficients:
##
##             Estimate Std. Error t value  Pr(>|t|)
## (Intercept)  1.58247    0.30397  5.2059 2.292e-07 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
print("test on big szie low B/M")
```

```
## [1] "test on big szie low B/M"
```

```
coeftest(lm(x$BIG.LoBM ~ 1), vcov. = NeweyWest(lm(x$BIG.LoBM ~ 1), lag = 6))
```

```
##
## t test of coefficients:
##
##             Estimate Std. Error t value  Pr(>|t|)
## (Intercept)  0.93137    0.16531   5.634 2.223e-08 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
diff <- x$SMALL.HiBM - x$BIG.LoBM
print("test on difference")
```

```
## [1] "test on difference"
```

```
coeftest(lm(diff ~ 1), vcov. = NeweyWest(lm(x$BIG.LoBM ~ 1), lag = 6))
```

```
##
## t test of coefficients:
##
##             Estimate Std. Error t value  Pr(>|t|)
## (Intercept)  0.65110    0.16531  3.9386 8.699e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
size = c(1,1,1,1,1,2,2,2,2,2,3,3,3,3,3,4,4,4,4,4,5,5,5,5,5)
bm =   c(1,2,3,4,5,1,2,3,4,5,1,2,3,4,5,1,2,3,4,5,1,2,3,4,5)
ALPHA = list()
SIZE = list()
BM = list()
T = 1129
for (i in 1:T){
  cross_section = as.vector(unlist(x[i,]))[2:26]
  result = coeftest(lm(cross_section ~ size + bm), vcov. = NeweyWest(lm(cross_section ~ size + bm), lag
  ALPHA[i] = result[1,1]
  SIZE[i] = result[2,1]
  BM[i] = result[3,1]
}

ALPHA = as.numeric(ALPHA)
SIZE = as.numeric(SIZE)
BM = as.numeric(BM)
print("test on alpha")
```

```
## [1] "test on alpha"
```

```
print(coeftest(lm(ALPHA ~ 1), vcov. = NeweyWest(lm(ALPHA ~ 1), lag = 6)))
```

```
##
## t test of coefficients:
##
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  1.01345    0.31177  3.2507 0.001185 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
print("test on size")
```

```
## [1] "test on size"
```

```
print(coeftest(lm(SIZE ~ 1), vcov. = NeweyWest(lm(SIZE ~ 1), lag = 6)))
```

```
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.055887   0.039298 -1.4221   0.1553
```

```
print("test on BM")
```

```
## [1] "test on BM"
```

```r
print(coeftest(lm(BM ~ 1), vcov. = NeweyWest(lm(BM ~ 1), lag = 6)))
```

```
##
## t test of coefficients:
##
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.100532   0.033186  3.0294 0.002506 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```r
y <- data.frame(read.csv("BETA.csv",skip = 15))
y <- data.frame(lapply(y, function(y) as.numeric(as.character(y))))
```

```
## Warning in FUN(X[[i]], ...): NAs introduced by coercion

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```

```r
y <- y[1:685,]
T2 <- 685
BETA = c(1,2,3,4,5,6,7,8,9,10)
beta = list()
for (i in 1:T2){
  cross_section = as.vector(unlist(y[i,]))[7:16]
  beta[i] = coeftest(lm(cross_section ~ BETA), vcov. = NeweyWest(lm(cross_section ~ BETA), lag = 6))[1,
}
beta = as.numeric(beta)
print(coeftest(lm(beta ~ 1), vcov. = NeweyWest(lm(beta ~ 1), lag = 6)))
```

```
##
## t test of coefficients:
##
##             Estimate Std. Error t value  Pr(>|t|)
## (Intercept)  0.92029    0.13630   6.752 3.117e-11 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```