Empirical exercise 6 − Part in Stata

1. Load the data

The routines in this file replicate the results obtained using matrix operations in MATLAB to demonstrate the mechanics behind the statistics we calculate in this exercise. Load the data in .dta format to the memory.

```
clear
load "C:\Users\username\Desktop\exercisesix.dta"
```

2. Obtain the standard errors of the OLS coefficient estimates

Consider OLS regression to obtain the standard errors.

```
reg unaid dur ncb rank year
```

3. Obtain the heteroskedasticity robust standard errors of the OLS coefficient estimates

Use the robust option to obtain the robust standard errors.

```
reg unaid dur ncb rank year, robust
```

4. Test for heteroskedasticity of unknown form

First create the interactions and squares. The for loop below is doing this automatically. The F test clearly rejects the null hypothesis of homoskedasticity. In the code below the line `cap drop _`Y'`X'` is for dropping double entries.

```
foreach X in dur ncb rank year {
        foreach Y in dur ncb rank year {
                cap drop _`Y'`X'
                gen _`X'`Y'= `X'*`Y'
        }
}
predict e, resid
gen e2 = e^2
reg e2 dur ncb rank year _*
```

5. Test for heteroskedasticity of known form

The F test clearly rejects the null hypothesis of no heteroskedasticity of exponential form.

```
gen le = log(e2)
```

```
reg le dur ncb rank year
```

6. Ttest for heteroskedasticity of unknown form in an augmented model

The F test clearly rejects the null hypothesis of homoskedasticity, yet this is partly driven by the increase in the degrees of freedom.

```
gen rk_first = (rank == 1)
gen rk_last = (rank == ncb)
reg unaid dur ncb rk* year
predict etwo, resid
gen etwo2 = e^2
foreach X in dur ncb rk_first rk_last year {
        foreach Y in dur ncb rk_first rk_last year {
                cap drop _`Y'`X'
                gen _`X'`Y'= `X'*`Y'
        }
}
reg etwo2 dur ncb rk* year _*
```

7. Obtain the FGLS coefficient estimates

Use the `aweight` option to specify the structure of the heteroskedasticity. To check what type of weights is required by the option `aweight`, type `help aweight` in the command prompt.

```
reg le dur ncb rank year
predict le_hat
gen w_hat = exp(le_hat)
reg unaid dur ncb rank year [aweight = 1/w_hat]
```