```
clear all
cd "C:\Users\chenz\Desktop\EconometricsTA\TA2"
use WAGE2,clear

*****************
******1.GLS******
*****************

*1.1 Heteroscedasticity

*residual plot
use WAGE2,clear
reg lwage IQ educ exper
rvfplot

*Test

**Breusch and Pagan test
use WAGE2,clear
reg lwage IQ educ exper
estat hettest, rhs
*or
reg lwage IQ educ exper
predict uhat,residual
gen uhat2=uhat^2
reg uhat2 IQ educ exper
test IQ=educ=exper=0

**White test
use WAGE2,clear
reg lwage IQ educ exper
estat imtest, white
*or
reg lwage IQ educ exper
predict uhat,residual
gen uhat2=uhat^2
reg uhat2 IQ educ exper c.IQ#c.educ c.IQ#c.exper c.educ#c.exper
test IQ=educ=exper=c.IQ#c.educ=c.IQ#c.exper=c.educ#c.exper=0

*Solution

**WLS
use WAGE2,clear
gen w=1/(educ)^0.5
gen wlogwage=lwage*w
gen weduc=educ*w
gen wexper=exper*w
reg wlogwage weduc wexper w

**FGLS
use WAGE2,clear
reg lwage educ exper
predict e, residual
gen logesq=ln(e*e)
reg logesq educ exper
predict esqhat,xb
gen omega=exp(esqhat)
gen w=1/(omega)^0.5
gen wlogwage=lwage*w
gen weduc=educ*w
gen wexper=exper*w
reg wlogwage weduc wexper w

*Robust SE
use WAGE2,clear
reg wage IQ educ exper,vce(robust)
*or
reg wage IQ educ exper,r
```

```
*1.2 Auto correlation

*Test

**DW test
use TRAFFIC2,clear
tsset t
reg totacc unem spdlaw wkends
estat dwatson

*BM test
use TRAFFIC2,clear
tsset t
reg totacc unem spdlaw wkends
estat bgodfrey,lag(2)

*Solution

**CO transformation
prais totacc unem spdlaw wkends, corc

**PW transformation
prais totacc unem spdlaw wkends

**auto correlated robust SE
newey totacc unem spdlaw wkends, lag(2)



*****************
******2.MLE******
*****************

*2.1 Estimation
use hsbdemo, clear
capture program drop lfols
program lfols
    version 10.1
    args lnf xb lnsigma
    local y "$ML_y1"
    *$ML_y1: name of first dependent variable
    quietly replace `lnf' = ln(normalden(`y', `xb', exp(`lnsigma')))
end
ml model lf lfols (xb: write = read female) (lnsigma:)
ml max
display exp([lnsigma]_cons)
reg write read female

*2.2 Test
** LR test
ml model lf lfols (xb: write = read female) (lnsigma:)
ml max
est sto m1
ml model lf lfols (xb: write = female) (lnsigma:)
ml max
est sto m2
lrtest m1 m2

** Wald test
ml model lf lfols (xb: write = read female) (lnsigma:)
ml max
test read=0




***************
******DCM******
***************
```

```
141   use WAGE2, clear
142   logit married educ lwage urban
143   est sto r1
144   predict yhat1,xb
145   estpost margins,dydx(*)
146   est sto r2
147   probit married educ lwage urban,r
148   est sto r3
149   estpost margins,dydx(*)
150   est sto r4
151   hetprob married educ lwage urban,het(lwage)
152   est sto r5
153   estpost margins,dydx(*)
154   est sto r6
155   est tab r1 r2 r3 r4 r5 r6,se
156
157
```