```
          IQ |   .0058647   .0009991     5.87   0.000     .0039039    .0078254
       name:  <unnamed>
        log:  D:\THU\Sophomore\Econometrics\PS2\2022011545.log
   log type:  text
  opened on:  25 Mar 2024, 15:06:57

 1 .
 2 . use wage2.dta

 3 .
 4 . **(a)i.
 5 . reg lwage educ IQ

      Source |       SS           df       MS      Number of obs   =       935
-------------+----------------------------------   F(2, 932)       =     69.38
       Model |  21.4683464         2  10.7341732   Prob > F        =    0.0000
    Residual |  144.187948       932  .154708099   R-squared       =    0.1296
-------------+----------------------------------   Adj R-squared   =    0.1277
       Total |  165.656294       934  .177362199   Root MSE        =    .39333

------------------------------------------------------------------------------
       lwage |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        educ |   .0390834   .0068433     5.71   0.000     .0256534    .0525134
          IQ |   .0058647   .0009991     5.87   0.000     .0039039    .0078254
       _cons |   5.649772   .0970865    58.19   0.000     5.459239    5.840305
------------------------------------------------------------------------------

 6 . **(a)ii.
 7 . reg educ IQ

      Source |       SS           df       MS      Number of obs   =       935
-------------+----------------------------------   F(1, 933)       =    339.82
       Model |  1203.2434         1   1203.2434   Prob > F        =    0.0000
    Residual |  3303.57586       933  3.54081013   R-squared       =    0.2670
-------------+----------------------------------   Adj R-squared   =    0.2662
       Total |  4506.81925       934  4.82528828   Root MSE        =    1.8817

------------------------------------------------------------------------------
        educ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          IQ |   .0754374   .0040922    18.43   0.000     .0674064    .0834685
       _cons |     5.7141   .4251266    13.44   0.000     4.879785    6.548415
------------------------------------------------------------------------------

 8 . predict r_hat, residuals

 9 . **(a)iii.
10 . reg lwage r_hat

      Source |       SS           df       MS      Number of obs   =       935
-------------+----------------------------------   F(1, 933)       =     29.31
       Model |   5.0462585         1   5.0462585   Prob > F        =    0.0000
    Residual |  160.610036       933  .172143661   R-squared       =    0.0305
-------------+----------------------------------   Adj R-squared   =    0.0294
       Total |  165.656294       934  .177362199   Root MSE        =     .4149

------------------------------------------------------------------------------
       lwage |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       r_hat |   .0390834   .0072186     5.41   0.000     .0249168      .05325
       _cons |   6.779004   .0135687   499.60   0.000     6.752375    6.805633
------------------------------------------------------------------------------
```

```
11 .
12 . **(b)
13 . reg lwage educ

      Source |       SS           df       MS      Number of obs   =       935
-------------+----------------------------------   F(1, 933)       =    100.70
       Model |  16.1377074         1  16.1377074   Prob > F        =    0.0000
    Residual |  149.518587       933   .16025572   R-squared       =    0.0974
-------------+----------------------------------   Adj R-squared   =    0.0964
       Total |  165.656294       934  .177362199   Root MSE        =    .40032

------------------------------------------------------------------------------
       lwage |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        educ |   .0598392   .0059631    10.03   0.000     .0481366    .0715418
       _cons |   5.973062   .0813737    73.40   0.000     5.813366    6.132759
------------------------------------------------------------------------------

14 .
15 . **(c)
16 . gen age_sqr = age^2

17 . reg lwage educ exper IQ age age_sqr

      Source |       SS           df       MS      Number of obs   =       935
-------------+----------------------------------   F(5, 929)       =     38.04
       Model |  28.1540956         5  5.63081913   Prob > F        =    0.0000
    Residual |  137.502199       929  .148010978   R-squared       =    0.1700
-------------+----------------------------------   Adj R-squared   =    0.1655
       Total |  165.656294       934  .177362199   Root MSE        =    .38472

------------------------------------------------------------------------------
       lwage |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        educ |   .0505776    .007665     6.60   0.000     .0355349    .0656202
       exper |    .013125    .003877     3.39   0.001     .0055164    .0207337
          IQ |   .0059706   .0009821     6.08   0.000     .0040432    .0078979
         age |   .0710713   .1025979     0.69   0.489    -.1302793    .2724219
     age_sqr |  -.0008531    .001539    -0.55   0.579    -.0038735    .0021672
       _cons |   3.923065   1.693822     2.32   0.021     .5989047    7.247226
------------------------------------------------------------------------------

18 .
19 . **(e)
20 . test age age_sqr

 ( 1)  age = 0
 ( 2)  age_sqr = 0

       F(  2,   929) =    4.46
            Prob > F =    0.0118

21 .
22 . **(g)
23 . gen educ_and_exper = educ + exper

24 . reg lwage educ educ_and_exper IQ age age_sqr, level(90)

      Source |       SS           df       MS      Number of obs   =       935
-------------+----------------------------------   F(5, 929)       =     38.04
       Model |  28.1540956         5  5.63081913   Prob > F        =    0.0000
    Residual |  137.502199       929  .148010978   R-squared       =    0.1700
-------------+----------------------------------   Adj R-squared   =    0.1655
       Total |  165.656294       934  .177362199   Root MSE        =    .38472
```

lwage	Coef.	Std. Err.	t	P>|t|	[90% Conf.	Interval]
educ	.0374525	.0067444	5.55	0.000	.0263478	.0485572
educ_and_ex~r	.013125	.003877	3.39	0.001	.0067416	.0195085
IQ	.0059706	.0009821	6.08	0.000	.0043536	.0075875
age	.0710713	.1025979	0.69	0.489	-.0978558	.2399983
age_sqr	-.0008531	.001539	-0.55	0.579	-.0033871	.0016809
_cons	3.923065	1.693822	2.32	0.021	1.134195	6.711935

```
25 .
26 . log close
      name:  <unnamed>
       log:  D:\THU\Sophomore\Econometrics\PS2\2022011545.log
  log type:  text
 closed on:  25 Mar 2024, 15:06:58
```