```
                                                            __  ___  ___  ___  ___(R)
                                                           /_  /  /__/  /  /__/
                                                          __/  /  /__/  /  /__/
                                                          Statistics/Data analysis
```

```
 1 .
 2 . * Answer II.2.(a)
 3 .
 4 . import delimited "ps4_data.csv"
   (6 vars, 14,493 obs)

 5 . gen potex0 = age - years_ed - 6

 6 . gen potex1 = potex0

 7 . replace potex1 = 0 if potex1 < 0
   (4 real changes made)

 8 . gen potex2 = potex1^2

 9 . gen female = 0

10 . replace female = 1 if sex == 2
   (6,955 real changes made)

11 . gen femed = female*years_ed

12 .
13 . reg ln_ahe female potex1 potex2 years_ed femed, r

   Linear regression                              Number of obs   =      14,493
                                                  F(5, 14487)     =      625.37
                                                  Prob > F        =      0.0000
                                                  R-squared       =      0.1892
                                                  Root MSE        =      .62218
```

ln_ahe	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf. Interval]	
female	-.5081907	.0544894	-9.33	0.000	-.6149969	-.4013846
potex1	.0271663	.00305	8.91	0.000	.0211879	.0331447
potex2	-.000409	.0000842	-4.86	0.000	-.0005742	-.0002439
years_ed	.0914789	.0025978	35.21	0.000	.086387	.0965709
femed	.0152355	.0040065	3.80	0.000	.0073822	.0230888
_cons	.8905078	.0447719	19.89	0.000	.8027492	.9782664

```
14 . esttab using PS4-22a.tex, replace compress ///
   >         varlabels(female Female potex1 "Potential Experience" potex2 "$\text{
   > Potential Experience}^2$" years_ed "Years of Education" femed "$\text{Female}
   > \times \text{Education}$" _cons Constant) ///
   >         nonumbers ///
   >         mtitles ("Log Hourly Wages") ///
   >         stats(N, fmt(%9.0gc))
   (output written to PS4-22a.tex)

15 .
16 . * Answer II.2.(b)
17 .
18 . gen femex1 = female*potex1

19 . gen femex2 = female*potex2

20 . eststo: reg ln_ahe female years_ed potex1 potex2, r

   Linear regression                              Number of obs   =      14,493
                                                  F(4, 14488)     =      785.96
                                                  Prob > F        =      0.0000
                                                  R-squared       =      0.1883
                                                  Root MSE        =      .62252
```

ln_ahe	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf. Interval]	
female	-.3046832	.0103579	-29.42	0.000	-.324986	-.2843805
years_ed	.0978685	.0020503	47.73	0.000	.0938496	.1018874
potex1	.0268553	.003057	8.78	0.000	.0208632	.0328474
potex2	-.0004023	.0000844	-4.76	0.000	-.0005678	-.0002368
_cons	.8084526	.0403464	20.04	0.000	.7293684	.8875368

(**est1** stored)

21 . eststo: reg ln_ahe female years_ed potex1 femex1 potex2 femex2, r

Linear regression

Number of obs	=	14,493
F(6, 14486)	=	535.51
Prob > F	=	0.0000
R-squared	=	0.1933
Root MSE	=	.62062

ln_ahe	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf. Interval]	
female	.0057197	.0489922	0.12	0.907	-.0903113	.1017508
years_ed	.098106	.0020498	47.86	0.000	.094088	.1021239
potex1	.039533	.0040295	9.81	0.000	.0316346	.0474314
femex1	-.0253226	.0060865	-4.16	0.000	-.0372528	-.0133923
potex2	-.0005828	.0001107	-5.27	0.000	-.0007997	-.0003658
femex2	.0003524	.0001696	2.08	0.038	.0000199	.0006848
_cons	.651321	.0452384	14.40	0.000	.562648	.739994

(**est2** stored)

22 . estimates store model1

23 . esttab using PS4-22b-1.tex, replace compress ///
>   varlabels(female Female potex1 "Potential Experience" potex2 "$\text{
> Potential Experience}^2$" years_ed "Years of Education" femex1 "$\text{Female
> }\times \text{Experience}$" femex2 "$\text{Female}\times \text{Experience}^2$
> " _cons Constant) ///
>   mtitles ("Log Hourly Wages" "Log Hourly Wages") ///
>   stats(N, fmt(%9.0gc))
(tabulating estimates stored by eststo; specify "." to tabulate the active resu
> lts)
(output written to PS4-22b-1.tex)

24 . eststo clear

25 .
26 . program drop _all

27 . program teststo, eclass
  1.   qui `*'
  2.   ereturn clear
  3.   matrix m_p = r(p)
  4.   matrix m_f = r(F)
  5.   matrix m_df = r(df)
  6.   matrix m_df_r = r(df_r)
  7.   ereturn matrix p = m_p
  8.   ereturn matrix f = m_f
  9.   ereturn matrix df = m_df
 10.   ereturn matrix df_r = m_df_r
 11.   ereturn local cmd "teststo"
 12. end

```
28 .
29 . estimates restore model1
   (results model1 are active now)

30 . test femex1 femex2

   ( 1)  femex1 = 0
   ( 2)  femex2 = 0

        F(  2, 14486) =   47.46
             Prob > F =    0.0000

31 . teststo test femex1 femex2

32 . esttab using PS4-22b-2.tex, replace compress ///
   >         cells("f(fmt(3)) p(fmt(3))") ///
   >         varlabels(c1 "Restrictions") ///
   >         nonumbers ///
   >         nomtitles ///
   >         collabels(F "$\text{Prob}>\text{F}$") ///
   >         noobs ///
   >         addnotes("$\text{(1) Female}\times\text{Experience} = 0$" "$\text{(2)
   >  Female}\times\text{Experience}^2 = 0$")
   (output written to PS4-22b-2.tex)

33 .
34 . * Answer II.2.(c)
35 .
36 . forvalues i = 1/5 {
       2.          gen race_`i' = 0
       3.          replace race_`i' = 1 if race == `i'
       4.          gen race_`i'_ed = race_`i'*years_ed
       5.          label variable race_`i' "Race `i'"
       6.          label variable race_`i'_ed "$\text{Education}\times \text{Race `i'
   > }$"
       7. }
   (12,599 real changes made)
   (1,277 real changes made)
   (116 real changes made)
   (433 real changes made)
   (68 real changes made)

37 .
38 . reg ln_ahe potex1 potex2 years_ed female femed race_1 race_1_ed race_2 race_2
   > _ed race_3 race_3_ed race_4 race_4_ed, r

   Linear regression                            Number of obs   =     14,493
                                                F(13, 14479)    =     248.47
                                                Prob > F        =     0.0000
                                                R-squared       =     0.1923
                                                Root MSE        =     .62115
```

ln_ahe	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf. Interval]	
potex1	.0274248	.0030478	9.00	0.000	.0214507	.033399
potex2	-.0004177	.0000842	-4.96	0.000	-.0005827	-.0002527
years_ed	.061674	.0257373	2.40	0.017	.0112257	.1121223
female	-.496803	.0543006	-9.15	0.000	-.603239	-.3903669
femed	.0146274	.0039924	3.66	0.000	.0068018	.0224529
race_1	-.2730609	.3122252	-0.87	0.382	-.8850623	.3389404
race_1_ed	.0283101	.0257416	1.10	0.271	-.0221468	.0787669
race_2	-.6500789	.3338515	-1.95	0.052	-1.30447	.0043126
race_2_ed	.0482092	.027288	1.77	0.077	-.0052787	.101697
race_3	-.091743	.4466582	-0.21	0.837	-.9672501	.7837642
race_3_ed	.0062358	.036329	0.17	0.864	-.0649737	.0774453
race_4	-.3832389	.3469374	-1.10	0.269	-1.063281	.2968028
race_4_ed	.0353012	.027907	1.26	0.206	-.0194001	.0900025
_cons	1.192812	.312769	3.81	0.000	.5797447	1.805879

```
39 . esttab using PS4-22c-1.tex, replace compress label ///
    >         varlabels(female Female potex1 "Potential Experience" potex2 "$\text{
    > Potential Experience}^2$" years_ed "Years of Education" femex1 "$\text{Female
    > }\times \text{Experience}$" femex2 "$\text{Female}\times \text{Experience}^2$
    > " femed "$\text{Education}\times \text{Female}$" _cons Constant) ///
    >         nonumbers ///
    >         mtitles ("Log Hourly Wages") ///
    >         stats(N, fmt(%9.0gc))
    (output written to PS4-22c-1.tex)

40 .
41 . test race_1_ed race_2_ed race_3_ed race_4_ed

    ( 1)  race_1_ed = 0
    ( 2)  race_2_ed = 0
    ( 3)  race_3_ed = 0
    ( 4)  race_4_ed = 0

        F(  4, 14479) =    1.69
            Prob > F =    0.1486

42 . teststo test race_1_ed race_2_ed race_3_ed race_4_ed

43 . esttab using PS4-22c-2.tex, replace compress ///
    >         cells("f(fmt(3)) p(fmt(3))") ///
    >         varlabels(c1 "Restrictions") ///
    >         nonumbers ///
    >         nomtitles ///
    >         collabels(F "$\text{Prob}>\text{F}$") ///
    >         noobs ///
    >         addnotes("$\text{(1) Education}\times\text{Race 1} = 0$" "$\text{(2)
    > Education}\times\text{Race 2} = 0$" "$\text{(3) Education}\times\text{Race 3}
    >  = 0$" "$\text{(4) Education}\times\text{Race 4} = 0$")
    (output written to PS4-22c-2.tex)

44 .
45 . * Answer II.2.(d)
46 .
47 . reg ln_ahe female years_ed femed potex1 femex1 potex2 femex2, r
```

Linear regression

					Number of obs	=	14,493
					F(7, 14485)	=	458.05
					Prob > F	=	0.0000
					R-squared	=	0.1934
					Root MSE	=	.62061

ln_ahe	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf. Interval]	
female	-.0658592	.0814242	-0.81	0.419	-.2254611	.0937427
years_ed	.0960648	.0026523	36.22	0.000	.090866	.1012636
femed	.0048286	.0041796	1.16	0.248	-.003364	.0130213
potex1	.0394956	.004025	9.81	0.000	.031606	.0473852
femex1	-.0251258	.0061054	-4.12	0.000	-.0370931	-.0131584
potex2	-.0005889	.0001104	-5.33	0.000	-.0008053	-.0003725
femex2	.0003629	.0001691	2.15	0.032	.0000315	.0006943
_cons	.6812709	.051893	13.13	0.000	.579554	.7829877

```
48 . teststo test femed femex1 femex2
```

```
49 . esttab using PS4-22d.tex, replace compress ///
   >          cells("f(fmt(3)) p(fmt(3))") ///
   >          varlabels(c1 "Restrictions") ///
   >          nonumbers ///
   >          nomtitles ///
   >          collabels(F "$\text{Prob}>\text{F}$") ///
   >          noobs ///
   >          addnotes("$\text{(1) Female}\times\text{Education} = 0$" "$\text{(2)
   > Female}\times\text{Potential Experience} = 0$" "$\text{(3) Female}\times\text
   > {Potential Experience}^2 = 0$")
   (output written to PS4-22d.tex)

50 . estimates clear

51 .
52 . log close
          name:  <unnamed>
           log:  C:\Users\wonja\Documents\GitHub\DEDP\14.320\PS4\PS4-22.smcl
      log type:  smcl
     closed on:  16 Apr 2021, 23:56:36
   ───────────────────────────────────────────────────────────────────────────
```