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log:
C:\Documenti\TOMMASO\lezioni\bocconi\econometria\esercitazione_emp_2\info2.1
> og
log type: text
opened on: 23 Oct 2008, 17:55:10

. use
"C:\Documenti\TOMMASO\lezioni\bocconi\econometria\esercitazione_emp_2\hprice.dta",
> clear
(Housing price data for Boston-area communities)

. des

Contains data from
C:\Documenti\TOMMASO\lezioni\bocconi\econometria\esercitazione_emp_2\h
> price.dta
obs:          506                Housing price data for Boston-area
                                communities
vars:          7                  20 Oct 2008 09:26
size:         16,192 (99.8% of memory free)
-----

```

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variable name	storage type	display format	value label	variable label
price	float	%9.0g		median housing price, \$
nox	float	%9.0g		nitrous oxide, parts per 100m
rooms	float	%9.0g		avg number of rooms per house
dist	float	%9.0g		weighted dist. to 5 employ centers
radial	float	%9.0g		accessibiliy index to radial
hghwys				
proptax	float	%9.0g		property tax per \$1000
stratio	float	%9.0g		average student-teacher ratio

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Sorted by:

```
. sum
```

Variable	Obs	Mean	Std. Dev.	Min	Max
price	506	22511.51	9208.856	5000	50001
nox	506	5.549783	1.158395	3.85	8.71
rooms	506	6.284051	.7025938	3.56	8.78
dist	506	3.795751	2.106137	1.13	12.13
radial	506	9.549407	8.707259	1	24
proptax	506	40.82372	16.85371	18.7	71.1
stratio	506	18.45929	2.16582	12.6	22

```

. g lprice=log(price)

. g ldist=log(dist)

. g lnox=log(nox)

. reg lprice lnox ldist rooms stratio

```

Source	SS	df	MS	Number of obs =	506
Model	49.3987586	4	12.3496897	F(4, 501) =	175.86
Residual	35.1834663	501	.07022648	Prob > F =	0.0000
Total	84.582225	505	.167489554	R-squared =	0.5840
				Adj R-squared =	0.5807
				Root MSE =	.265

lprice	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
lnox	-.9535388	.1167417	-8.17	0.000	-1.182902 - .7241751
ldist	-.1343395	.0431032	-3.12	0.002	-.2190247 - .0496542
rooms	.2545271	.0185303	13.74	0.000	.2181203 .2909338
stratio	-.0524511	.0058971	-8.89	0.000	-.0640372 - .040865
_cons	11.08386	.3181113	34.84	0.000	10.45887 11.70886

. estat ovtest

Ramsey RESET test using powers of the fitted values of lprice

Ho: model has no omitted variables

F(3, 498) = 9.69

Prob > F = 0.0000

. g rooms2=rooms^2

. gen lproptax=log(proptax)

. estat ovtest

Ramsey RESET test using powers of the fitted values of lprice

Ho: model has no omitted variables

F(3, 498) = 9.69

Prob > F = 0.0000

. reg lprice lnnox ldlist rooms rooms2 stratio lproptax

Source	SS	df	MS	Number of obs =	506
Model	52.8357709	6	8.80596182	F(6, 499) =	138.41
Residual	31.746454	499	.063620148	Prob > F =	0.0000
Total	84.582225	505	.167489554	R-squared =	0.6247
				Adj R-squared =	0.6202
				Root MSE =	.25223

lprice	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
lnnox	-.6615683	.1201605	-5.51	0.000	-.8976511 - .4254856
ldlist	-.0950863	.0421434	-2.26	0.024	-.1778868 - .0122859
rooms	-.5625668	.1610314	-3.49	0.001	-.87895 - .2461837
rooms2	.0634347	.0124621	5.09	0.000	.0389501 .0879193
stratio	-.0362927	.0060699	-5.98	0.000	-.0482184 - .0243671
lproptax	-.2211125	.0410201	-5.39	0.000	-.301706 - .1405191
_cons	13.64541	.5533245	24.66	0.000	12.55827 14.73254

. estat ovtest

Ramsey RESET test using powers of the fitted values of lprice

Ho: model has no omitted variables

F(3, 496) = 1.64

Prob > F = 0.1798

```
. predict lprice_hat
(option xb assumed; fitted values)

. g lprice_hat2=lprice_hat^2

. g lprice_hat3=lprice_hat^3

. g lprice_hat4=lprice_hat^4

. reg lprice lnox ldist rooms rooms2 stratio lproptax
```

Source	SS	df	MS	Number of obs =	506
Model	52.8357709	6	8.80596182	F(6, 499) =	138.41
Residual	31.746454	499	.063620148	Prob > F =	0.0000
				R-squared =	0.6247
				Adj R-squared =	0.6202
				Root MSE =	.25223
Total	84.582225	505	.167489554		

lprice	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
lnox	-.6615683	.1201605	-5.51	0.000	-.8976511	-.4254856
ldist	-.0950863	.0421434	-2.26	0.024	-.1778868	-.0122859
rooms	-.5625668	.1610314	-3.49	0.001	-.87895	-.2461837
rooms2	.0634347	.0124621	5.09	0.000	.0389501	.0879193
stratio	-.0362927	.0060699	-5.98	0.000	-.0482184	-.0243671
lproptax	-.2211125	.0410201	-5.39	0.000	-.301706	-.1405191
_cons	13.64541	.5533245	24.66	0.000	12.55827	14.73254

```
. reg lprice lnox ldist rooms rooms2 stratio lproptax lprice_hat2 lprice_hat3
lprice_hat4
```

Source	SS	df	MS	Number of obs =	506
Model	53.1460008	9	5.9051112	F(9, 496) =	93.17
Residual	31.4362242	496	.063379484	Prob > F =	0.0000
				R-squared =	0.6283
				Adj R-squared =	0.6216
				Root MSE =	.25175
Total	84.582225	505	.167489554		

lprice	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
lnox	-404.6793	1263.029	-0.32	0.749	-2886.225	2076.867
ldist	-58.1645	181.5311	-0.32	0.749	-414.8291	298.5001
rooms	-344.4431	1074.019	-0.32	0.749	-2454.63	1765.744
rooms2	38.831	121.1049	0.32	0.749	-199.1109	276.7729
stratio	-22.20191	69.28783	-0.32	0.749	-158.3357	113.9319
lproptax	-135.2636	422.1326	-0.32	0.749	-964.6522	694.125
lprice_hat2	-93.53387	282.2645	-0.33	0.741	-648.1153	461.0476
lprice_hat3	6.369082	18.53388	0.34	0.731	-30.04551	42.78368
lprice_hat4	-.1626918	.4560104	-0.36	0.721	-1.058642	.7332584
_cons	6852.09	21212.6	0.32	0.747	-34825.54	48529.72

```
. test (lprice_hat2=0) (lprice_hat3=0) (lprice_hat4=0)
```

(1) lprice_hat2 = 0

```
( 2) lprice_hat3 = 0
( 3) lprice_hat4 = 0
```

```
F( 3, 496) = 1.63
Prob > F = 0.1811
```

```
. reg lprice lnox ldist rooms rooms2 stratio lproptax
```

Source	SS	df	MS	Number of obs =	506
Model	52.8357709	6	8.80596182	F(6, 499) =	138.41
Residual	31.746454	499	.063620148	Prob > F =	0.0000
				R-squared =	0.6247
				Adj R-squared =	0.6202
Total	84.582225	505	.167489554	Root MSE =	.25223

lprice	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
lnox	-.6615683	.1201605	-5.51	0.000	-.8976511	-.4254856
ldist	-.0950863	.0421434	-2.26	0.024	-.1778868	-.0122859
rooms	-.5625668	.1610314	-3.49	0.001	-.87895	-.2461837
rooms2	.0634347	.0124621	5.09	0.000	.0389501	.0879193
stratio	-.0362927	.0060699	-5.98	0.000	-.0482184	-.0243671
lproptax	-.2211125	.0410201	-5.39	0.000	-.301706	-.1405191
_cons	13.64541	.5533245	24.66	0.000	12.55827	14.73254

```
. predict resid,r
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```
. twoway (scatter resid lprice_hat)
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```
. graph save Graph
```

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"C:\Documenti\TOMMASO\lezioni\bocconi\econometria\esercitazione_emp_2\  
> Graph2.gph"
```

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(file
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C:\Documenti\TOMMASO\lezioni\bocconi\econometria\esercitazione_emp_2\Graph2.gph
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sav
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> ed)
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```
. estat hettest
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```
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
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Ho: Constant variance
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```
Variables: fitted values of lprice
```

```
chi2(1) = 137.18
```

```
Prob > chi2 = 0.0000
```

```
. estat hettest,iid
```

```
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
```

```
Ho: Constant variance
```

```
Variables: fitted values of lprice
```

```
chi2(1) = 37.82
```

```
Prob > chi2 = 0.0000
```

```
. estat hettest,iid rhs
```

```
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
```

```
Ho: Constant variance
```

Variables: lnox ldist rooms rooms2 stratio lproptax

chi2(6) = 95.55
 Prob > chi2 = 0.0000

. g resid2=resid^2

. reg resid2 lnox ldist rooms rooms2 stratio lproptax

Source	SS	df	MS	Number of obs =	506
Model	2.72811321	6	.454685535	F(6, 499) =	19.36
Residual	11.7196484	499	.023486269	Prob > F =	0.0000
				R-squared =	0.1888
				Adj R-squared =	0.1791
Total	14.4477616	505	.028609429	Root MSE =	.15325

resid2	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
lnox	-.1849848	.0730081	-2.53	0.012	-.328426	-.0415436
ldist	-.1031465	.0256059	-4.03	0.000	-.1534551	-.0528379
rooms	-.1422846	.0978409	-1.45	0.147	-.3345155	.0499462
rooms2	.0107794	.0075718	1.42	0.155	-.0040972	.025656
stratio	.0040221	.003688	1.09	0.276	-.0032238	.011268
lproptax	.1295504	.0249234	5.20	0.000	.0805827	.1785181
_cons	.4172804	.3361937	1.24	0.215	-.2432493	1.07781

. reg lprice lnox ldist rooms rooms2 stratio lproptax

Source	SS	df	MS	Number of obs =	506
Model	52.8357709	6	8.80596182	F(6, 499) =	138.41
Residual	31.746454	499	.063620148	Prob > F =	0.0000
				R-squared =	0.6247
				Adj R-squared =	0.6202
Total	84.582225	505	.167489554	Root MSE =	.25223

lprice	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
lnox	-.6615683	.1201605	-5.51	0.000	-.8976511	-.4254856
ldist	-.0950863	.0421434	-2.26	0.024	-.1778868	-.0122859
rooms	-.5625668	.1610314	-3.49	0.001	-.87895	-.2461837
rooms2	.0634347	.0124621	5.09	0.000	.0389501	.0879193
stratio	-.0362927	.0060699	-5.98	0.000	-.0482184	-.0243671
lproptax	-.2211125	.0410201	-5.39	0.000	-.301706	-.1405191
_cons	13.64541	.5533245	24.66	0.000	12.55827	14.73254

. reg lprice lnox ldist rooms rooms2 stratio lproptax, vce(robust)

Linear regression

Number of obs = 506
 F(6, 499) = 148.24
 Prob > F = 0.0000
 R-squared = 0.6247
 Root MSE = .25223

lprice	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
lprice						

lnox	-.6615683	.1421868	-4.65	0.000	-.940927	-.3822097
ldist	-.0950863	.0556016	-1.71	0.088	-.2043285	.0141558
rooms	-.5625668	.2777775	-2.03	0.043	-1.108324	-.0168092
rooms2	.0634347	.0207814	3.05	0.002	.0226048	.1042646
stratio	-.0362927	.0041145	-8.82	0.000	-.0443765	-.0282089
lproptax	-.2211125	.0374549	-5.90	0.000	-.2947013	-.1475238
_cons	13.64541	.9189826	14.85	0.000	11.83985	15.45096

```
. reg lprice lnox ldist rooms rooms2 stratio lproptax [aw=1/rooms2]
(sum of wgt is 1.3317e+01)
```

Source	SS	df	MS	Number of obs =	506
Model	45.997138	6	7.66618967	F(6, 499) =	109.19
Residual	35.0346279	499	.070209675	Prob > F =	0.0000
				R-squared =	0.5676
				Adj R-squared =	0.5624
Total	81.031766	505	.160458943	Root MSE =	.26497

lprice	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
lnox	-.631969	.1239733	-5.10	0.000	-.8755431 - .3883949
ldist	-.0722358	.0442426	-1.63	0.103	-.1591606 .014689
rooms	-.9456208	.1486483	-6.36	0.000	-1.237674 -.6535672
rooms2	.093697	.0120765	7.76	0.000	.0699699 .117424
stratio	-.0338826	.0064993	-5.21	0.000	-.0466519 -.0211133
lproptax	-.217709	.0431656	-5.04	0.000	-.3025176 -.1329003
_cons	14.70849	.497346	29.57	0.000	13.73134 15.68564

```
. save hprice_new.dta,replace
(note: file hprice_new.dta not found)
file hprice_new.dta saved
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. log close
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log:
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C:\Documenti\TOMMASO\lezioni\bocconi\econometria\esercitazione_emp_2\info2.1
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> og
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log type: text
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closed on: 23 Oct 2008, 18:05:39
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