

Crystal Hernandez
HW#2
Econ B2000, MA Econometrics

1) Jianwen Wu & Allabt Keely

2) Using the CEX data, do a few interesting linear regressions. Clearly explain the null hypothesis and statistical tests for the coefficient estimates. Show some graphs that help understand the variation. What are some of the important determinants of this variation? What are some of the limitations?

```
> load("~/cex_2012.RData")
> summary(data_cex)
```

NEWID	AGE_REF	female	educ_nohs
Min. :2377165	Min. :16.00	Min. :0.0000	Min. :0.00000
1st Qu.:2413389	1st Qu.:36.00	1st Qu.:0.0000	1st Qu.:0.00000
Median :2449043	Median :50.00	Median :1.0000	Median :0.00000
Mean :2448315	Mean :50.08	Mean :0.5332	Mean :0.08453
3rd Qu.:2482690	3rd Qu.:63.00	3rd Qu.:1.0000	3rd Qu.:0.00000
Max. :2545083	Max. :87.00	Max. :1.0000	Max. :1.00000

educ_hs	educ_smcoll	educ_as	educ_bach
Min. :0.0000	Min. :0.0000	Min. :0.0000	Min. :0.0000
1st Qu.:0.0000	1st Qu.:0.0000	1st Qu.:0.0000	1st Qu.:0.0000
Median :0.0000	Median :0.0000	Median :0.0000	Median :0.0000
Mean :0.2485	Mean :0.2033	Mean :0.1019	Mean :0.1957
3rd Qu.:0.0000	3rd Qu.:0.0000	3rd Qu.:0.0000	3rd Qu.:0.0000
Max. :1.0000	Max. :1.0000	Max. :1.0000	Max. :1.0000

educ_adv	white	AfAm	Amindian
Min. :0.00000	Min. :0.000	Min. :0.0000	Min. :0.00000
1st Qu.:0.00000	1st Qu.:1.000	1st Qu.:0.0000	1st Qu.:0.00000
Median :0.00000	Median :1.000	Median :0.0000	Median :0.00000
Mean :0.08599	Mean :0.801	Mean :0.1284	Mean :0.00819
3rd Qu.:0.00000	3rd Qu.:1.000	3rd Qu.:0.0000	3rd Qu.:0.00000
Max. :1.00000	Max. :1.000	Max. :1.0000	Max. :1.00000

Asian	race_oth	Hispanic	Hisp_Mex
Min. :0.00000	Min. :0.0000	Min. :0.0000	Min. :0.00000
1st Qu.:0.00000	1st Qu.:0.0000	1st Qu.:0.0000	1st Qu.:0.00000
Median :0.00000	Median :0.0000	Median :0.0000	Median :0.00000
Mean :0.04884	Mean :0.0136	Mean :0.1348	Mean :0.08365
3rd Qu.:0.00000	3rd Qu.:0.0000	3rd Qu.:0.0000	3rd Qu.:0.00000
Max. :1.00000	Max. :1.0000	Max. :1.0000	Max. :1.00000

Hisp_PR	Hisp_Cuban	Married	divwidsep
Min. :0.00000	Min. :0.000000	Min. :0.0000	Min. :0.0000
1st Qu.:0.00000	1st Qu.:0.000000	1st Qu.:0.0000	1st Qu.:0.0000
Median :0.00000	Median :0.000000	Median :1.0000	Median :0.0000
Mean :0.01272	Mean :0.005703	Mean :0.5048	Mean :0.2817
3rd Qu.:0.00000	3rd Qu.:0.000000	3rd Qu.:1.0000	3rd Qu.:1.0000
Max. :1.00000	Max. :1.000000	Max. :1.0000	Max. :1.0000

unmarried	AS_COMP1	AS_COMP2	AS_COMP3	AS_COM
Min. :0.0000	Min. :0.0000	Min. :0.000	Min. :0.0000	Min. :0
1st Qu.:0.0000	1st Qu.:1.0000	1st Qu.:1.000	1st Qu.:0.0000	1st Qu.:0
Median :0.0000	Median :1.0000	Median :1.000	Median :0.0000	Median :0
Mean :0.2135	Mean :0.9238	Mean :1.017	Mean :0.2508	Mean :0
3rd Qu.:0.0000	3rd Qu.:1.0000	3rd Qu.:1.000	3rd Qu.:0.0000	3rd Qu.:0
Max. :1.0000	Max. :6.0000	Max. :8.000	Max. :4.0000	Max. :6

AS_COMP5	AGE2	SEX_REF	SEX2	EDUC_REF	EDUCA2
Min. :0.0000	Min. :14.00	1:3192	:3526	12 :1699	:35
1st Qu.:0.0000	1st Qu.:37.00	2:3646	1:1561	13 :1390	12 : 9
Median :0.0000	Median :49.00		2:1751	15 :1338	15 : 7
Mean :0.0718	Mean :49.79			14 : 697	13 : 5
3rd Qu.:0.0000	3rd Qu.:60.00			16 : 588	14 : 3
Max. :3.0000	Max. :87.00			11 : 578	16 : 3
	NA's :3526			(Other): 548	(Other): 5

MARITAL1	REF_RACE	RACE2	HORREF1	HORREF2	REGION	STATE	PS
1:3452	1:5477	:3526	0:5916	:6342	: 42	: 919	
2: 665	2: 878	1:2809	1: 347	1: 220	1:1328	06 : 728	1419
3:1048	3: 30	2: 245	2: 225	2: 117	2:1484	48 : 454	1207
4: 213	4: 334	3: 10	3: 15	3: 2	3:2431	36 : 435	1109
5:1460	5: 26	4: 212	4: 87	4: 31	4:1553	12 : 385	1110
6: 93	5: 13	5: 39	5: 20			42 : 360	1422
	6: 23	6: 209	6: 106			(Other):3557	(Other)

POPSIZE	BLS_URBN	CUTENURE	EARNCOMP	FAM_SIZE	FAM_TYPE
: 42	1:6490	1:2588	1 :2028	Min. : 1.000	8 :2046
1:2426	2: 348	2:1675	8 :1553	1st Qu.: 1.000	1 :1377
2:1584		4:2437	2 :1468	Median : 2.000	9 :1094
3: 485		5: 93	4 : 695	Mean : 2.499	3 : 860
4:1495		6: 45	5 : 438	3rd Qu.: 3.000	4 : 437
5: 806			3 : 318	Max. :16.000	2 : 337
			(Other): 338		(Other): 687

INC_RANK	NO_EARNR	VEHQ	VEHQL	SMSASTAT
Min. :0.0002	Min. :0.000	Min. : 0.000	Min. :0.00000	1:5956
1st Qu.:0.2438	1st Qu.:1.000	1st Qu.: 1.000	1st Qu.:0.00000	2: 882

Median :0.4964	Median :1.000	Median : 2.000	Median :0.00000
Mean :0.4991	Mean :1.245	Mean : 1.785	Mean :0.03378
3rd Qu.:0.7536	3rd Qu.:2.000	3rd Qu.: 2.000	3rd Qu.:0.00000
Max. :1.0000	Max. :8.000	Max. :17.000	Max. :4.00000
NA's :1134			

POV_CY	POV_PY	INC_HRS1	INC_HRS2	INCWEEK1	INCWEEK
2					
:1149	:1149	Min. : 1.00	Min. : 1.00	Min. : 0.00	Min. : 0
.00					
1:1007	1: 959	1st Qu.:36.00	1st Qu.:40.00	1st Qu.: 0.00	1st Qu.: 0
.00					
2:4682	2:4730	Median :40.00	Median :40.00	Median :48.00	Median :52
.00					
		Mean :39.74	Mean :41.06	Mean :30.29	Mean :32
.61					
		3rd Qu.:45.00	3rd Qu.:45.00	3rd Qu.:52.00	3rd Qu.:52
.00					
		Max. :99.00	Max. :99.00	Max. :52.00	Max. :52
.00					
		NA's :2320	NA's :4536		NA's :35

INCNONW1	INCNONW2	OCCUCOD1	OCCUCOD2	FINCATAX	FINCBTA
26					
X					
:4518	:5828	:2320	:4536	Min. : -193882	Min. : -
74812					
1:1266	1: 515	03 : 959	03 : 501	1st Qu.: 11499	1st Qu.:
11565					
2: 401	2: 312	10 : 678	01 : 309	Median : 34044	Median :
34137					
3: 104	3: 17	01 : 527	10 : 288	Mean : 50915	Mean :
53176					
4: 422	4: 110	04 : 405	04 : 191	3rd Qu.: 69805	3rd Qu.:
72573					
5: 111	5: 44	02 : 293	02 : 164	Max. :1047017	Max. :10
47017					
6: 16	6: 12	(Other):1656	(Other): 849		

FSALARYX	TOTEXPPQ	TOTEXPCQ	FOODPQ
Min. : 0	Min. : -639.3	Min. : 0	Min. : 0.0
1st Qu.: 0	1st Qu.: 3200.1	1st Qu.: 0	1st Qu.: 520.0
Median : 22000	Median : 5946.9	Median : 2460	Median : 925.5
Mean : 41869	Mean : 8377.4	Mean : 3995	Mean : 1208.6
3rd Qu.: 60750	3rd Qu.: 10523.7	3rd Qu.: 5412	3rd Qu.: 1565.5
Max. :734607	Max. :171457.3	Max. :185951	Max. :19040.0

FOODCQ	FDHOMEPCQ	FDHOMEPCQ	FDAWAYCQ
Min. : 0.0	Min. : 0.0	Min. : 0.0	Min. : 0.00
1st Qu.: 0.0	1st Qu.: 390.0	1st Qu.: 0.0	1st Qu.: 0.00
Median : 423.5	Median : 650.0	Median : 303.3	Median : 43.33
Mean : 598.1	Mean : 832.3	Mean : 413.8	Mean : 184.29
3rd Qu.: 888.3	3rd Qu.: 1095.5	3rd Qu.: 650.0	3rd Qu.: 216.67
Max. :7620.0	Max. :17283.0	Max. :4853.3	Max. :5608.33

FDAWAYPQ	ALCBEPVQ	ALCBEPVQ	HOUSCQ
Min. : 0.0	Min. : 0.00	Min. : 0.00	Min. : 0
1st Qu.: 52.0	1st Qu.: 0.00	1st Qu.: 0.00	1st Qu.: 0
Median : 216.7	Median : 0.00	Median : 0.00	Median : 845
Mean : 376.3	Mean : 27.76	Mean : 58.78	Mean : 1323

3rd Qu.: 455.0	3rd Qu.: 0.00	3rd Qu.: 50.00	3rd Qu.: 1883
Max.: 18390.0	Max.: 2000.00	Max.: 4340.00	Max.: 29178

HOUSPQ	MRTINTCQ	MRTINTPQ	RENDWECQ
Min.: -407.3	Min.: 0	Min.: 0.0	Min.: 0.0
1st Qu.: 1059.9	1st Qu.: 0	1st Qu.: 0.0	1st Qu.: 0.0
Median: 1975.0	Median: 0	Median: 0.0	Median: 0.0
Mean: 2770.0	Mean: 257	Mean: 528.1	Mean: 276.3
3rd Qu.: 3535.6	3rd Qu.: 47	3rd Qu.: 607.0	3rd Qu.: 0.0
Max.: 48733.5	Max.: 14634	Max.: 24674.0	Max.: 10748.0

RENDWEPQ	UTILCQ	UTILPQ	NTLGASCQ
Min.: 0.0	Min.: 0.0	Min.: 0.0	Min.: 0.00
1st Qu.: 0.0	1st Qu.: 0.0	1st Qu.: 280.0	1st Qu.: 0.00
Median: 0.0	Median: 230.5	Median: 510.0	Median: 0.00
Mean: 576.6	Mean: 322.9	Mean: 630.7	Mean: 45.87
3rd Qu.: 800.0	3rd Qu.: 513.8	3rd Qu.: 867.0	3rd Qu.: 60.00
Max.: 8261.0	Max.: 4410.0	Max.: 10084.0	Max.: 1436.00

NTLGASQP	ELCTRCCQ	ELCTRCQP	ALLFULCQ
Min.: 0.00	Min.: 0.0	Min.: 0.0	Min.: 0.00
1st Qu.: 0.00	1st Qu.: 0.0	1st Qu.: 90.0	1st Qu.: 0.00
Median: 0.00	Median: 75.0	Median: 179.0	Median: 0.00
Mean: 78.73	Mean: 113.6	Mean: 226.3	Mean: 18.98
3rd Qu.: 120.00	3rd Qu.: 179.0	3rd Qu.: 301.0	3rd Qu.: 0.00
Max.: 1800.00	Max.: 1321.0	Max.: 6366.0	Max.: 2350.00

ALLFULPQ	TELEPHCQ	TELEPHPQ	WATRPSCQ
Min.: 0.00	Min.: 0.0	Min.: 0.0	Min.: 0.00
1st Qu.: 0.00	1st Qu.: 0.0	1st Qu.: 70.0	1st Qu.: 0.00
Median: 0.00	Median: 55.0	Median: 150.0	Median: 0.00
Mean: 31.07	Mean: 100.1	Mean: 206.2	Mean: 44.37
3rd Qu.: 0.00	3rd Qu.: 151.0	3rd Qu.: 284.0	3rd Qu.: 64.00
Max.: 3056.00	Max.: 1201.0	Max.: 1798.0	Max.: 1714.00

WATRPSPQ	BBYDAYCQ	BBYDAYPQ	HOUSEQCQ
Min.: 0.00	Min.: 0.00	Min.: 0.00	Min.: 0.00
1st Qu.: 0.00	1st Qu.: 0.00	1st Qu.: 0.00	1st Qu.: 0.00
Median: 48.00	Median: 0.00	Median: 0.00	Median: 0.00
Mean: 88.53	Mean: 25.84	Mean: 63.13	Mean: 75.59
3rd Qu.: 131.00	3rd Qu.: 0.00	3rd Qu.: 0.00	3rd Qu.: 0.00
Max.: 2733.00	Max.: 5000.00	Max.: 9000.00	Max.: 10280.00

HOUSEQPQ	APPARCQ	APPARPQ	MENBOYCQ
Min.: 0.0	Min.: 0.00	Min.: 0.0	Min.: 0.0
1st Qu.: 0.0	1st Qu.: 0.00	1st Qu.: 0.0	1st Qu.: 0.0
Median: 0.0	Median: 0.00	Median: 96.0	Median: 0.0
Mean: 215.4	Mean: 67.92	Mean: 282.6	Mean: 16.4
3rd Qu.: 150.0	3rd Qu.: 44.33	3rd Qu.: 328.0	3rd Qu.: 0.0
Max.: 14700.0	Max.: 5506.67	Max.: 53100.0	Max.: 5350.0

MENBOYPQ	WOMGRLCQ	WOMGRLPQ	FOOTWRCQ
Min.: 0.00	Min.: 0.00	Min.: 0.00	Min.: 0.00
1st Qu.: 0.00	1st Qu.: 0.00	1st Qu.: 0.00	1st Qu.: 0.00
Median: 0.00	Median: 0.00	Median: 0.00	Median: 0.00
Mean: 74.09	Mean: 22.56	Mean: 98.08	Mean: 10.64
3rd Qu.: 76.00	3rd Qu.: 0.00	3rd Qu.: 107.00	3rd Qu.: 0.00

Max. :3923.00 Max. :2485.00 Max. :6763.00 Max. :1506.00

FOOTWRPQ	TRANSCQ	TRANSPQ	GASMOCQ
Min. : 0.00	Min. : 0.0	Min. : 0.0	Min. : 0.0
1st Qu.: 0.00	1st Qu.: 0.0	1st Qu.: 236.2	1st Qu.: 0.0
Median : 0.00	Median : 175.0	Median : 593.5	Median : 100.0
Mean : 36.51	Mean : 660.9	Mean : 1370.3	Mean : 217.7
3rd Qu.: 27.00	3rd Qu.: 623.0	3rd Qu.: 1275.5	3rd Qu.: 310.0
Max. :1709.00	Max. :61815.0	Max. :94680.0	Max. :5950.0

GASMOPQ	HEALTHCQ	HEALTHPQ	HLTHINCQ
Min. : 0.0	Min. :-2798.4	Min. :-3235.20	Min. : 0.0
1st Qu.: 128.9	1st Qu.: 0.0	1st Qu.: 13.33	1st Qu.: 0.0
Median : 300.0	Median : 10.0	Median : 252.80	Median : 0.0
Mean : 432.5	Mean : 276.3	Mean : 522.60	Mean : 162.3
3rd Qu.: 600.0	3rd Qu.: 320.0	3rd Qu.: 650.00	3rd Qu.: 199.9
Max. :5475.0	Max. :12865.0	Max. :31705.00	Max. :5596.4

HLTHINPQ	ENTERTCQ	ENTERTPQ	PETTOYCQ
Min. : 0.0	Min. : 0.0	Min. : 0.0	Min. : 0.00
1st Qu.: 0.0	1st Qu.: 0.0	1st Qu.: 79.0	1st Qu.: 0.00
Median : 160.0	Median : 56.0	Median : 212.0	Median : 0.00
Mean : 331.2	Mean : 168.2	Mean : 452.8	Mean : 27.98
3rd Qu.: 428.0	3rd Qu.: 180.0	3rd Qu.: 526.7	3rd Qu.: 0.00
Max. :29401.0	Max. :8306.7	Max. :25100.0	Max. :8000.00

PETTOYPQ	PERSCACQ	PERSCAPQ	EDUCACQ
Min. : 0.0	Min. : 0.00	Min. : 0.00	Min. : 0.0
1st Qu.: 0.0	1st Qu.: 0.00	1st Qu.: 0.00	1st Qu.: 0.0
Median : 0.0	Median : 0.00	Median : 16.67	Median : 0.0
Mean : 106.4	Mean : 24.72	Mean : 50.33	Mean : 140.3
3rd Qu.: 90.0	3rd Qu.: 26.67	3rd Qu.: 66.67	3rd Qu.: 0.0
Max. :25000.0	Max. :1033.33	Max. :1200.00	Max. :31725.0

EDUCAPQ	TOBACCCQ	TOBACCPQ	BUILDING	UNIS
TRQ				
Min. : 0.0	Min. : 0.00	Min. : 0.00	01 :4259	03
:4113				
1st Qu.: 0.0	1st Qu.: 0.00	1st Qu.: 0.00	08 :1093	04
: 412				
Median : 0.0	Median : 0.00	Median : 0.00	02 : 343	07
: 379				
Mean : 158.4	Mean : 25.89	Mean : 50.78	09 : 315	08
: 340				
3rd Qu.: 0.0	3rd Qu.: 0.00	3rd Qu.: 0.00	04 : 241	10
: 313				
Max. :31000.0	Max. :1300.00	Max. :3900.00	07 : 153	06
: 312				

(Other): 434 (Other)

: 969

BUILT	HEATFUEL	WATERHT
:1783	: 141	: 211
1970 : 422	01:3520	01:3518
1975 : 384	02:2292	02:2666
1980 : 367	03: 455	03: 278
1960 : 342	04: 320	04: 149
1950 : 340	05: 110	05: 16

```

(Other):3200
> attach(data_cex)
> names(data_cex)
 [1] "NEWID"      "AGE_REF"    "female"     "educ_nohs"  "educ_hs"
 [6] "educ_smcoll" "educ_as"    "educ_bach"  "educ_adv"   "white"
[11] "AfAm"       "Amindian"   "Asian"      "race_oth"   "Hispanic"
[16] "Hisp_Mex"    "Hisp_PR"    "Hisp_Cuban" "Married"    "divwidsep"
[21] "unmarried"   "AS_COMP1"   "AS_COMP2"   "AS_COMP3"   "AS_COMP4"
[26] "AS_COMP5"    "AGE2"       "SEX_REF"    "SEX2"       "EDUC_REF"
[31] "EDUCA2"      "MARITAL1"   "REF_RACE"   "RACE2"      "HORREF1"
[36] "HORREF2"     "REGION"     "STATE"      "PSU"        "POPSIZE"
[41] "BLS_URBN"    "CUTENURE"   "EARNCOMP"   "FAM_SIZE"   "FAM_TYPE"
[46] "INC_RANK"    "NO_EARNR"   "VEHQ"       "VEHQL"      "SMSASTAT"
[51] "POV_CY"      "POV_PY"     "INC_HRS1"   "INC_HRS2"   "INCWEEK1"
[56] "INCWEEK2"    "INCNONW1"   "INCNONW2"   "OCCUCOD1"   "OCCUCOD2"
[61] "FINCATAX"    "FINCBTAX"   "FSALARYX"   "TOTEXPPQ"   "TOTEXPCQ"
[66] "FOODPQ"      "FOODCQ"     "FDHOMEPCQ"  "FDHOMEPCQ"  "FDAWAYCQ"
[71] "FDAWAYPQ"    "ALCBEVCQ"   "ALCBEVPQ"   "HOUSCQ"     "HOUSPQ"
[76] "MRTINTCQ"    "MRTINTPQ"   "RENDWECQ"   "RENDWEPQ"   "UTILCQ"
[81] "UTILPQ"      "NTLGASCQ"   "NTLGASPCQ"  "ELCTRCCQ"   "ELCTRCPQ"
[86] "ALLFULCQ"    "ALLFULPQ"   "TELEPHCQ"   "TELEPHPQ"   "WATRPSCQ"
[91] "WATRPSPQ"    "BBYDAYCQ"   "BBYDAYPQ"   "HOUSEQCQ"   "HOUSEQPQ"
[96] "APPARCQ"     "APPARPQ"    "MENBOYCQ"   "MENBOYPQ"   "WOMGRLCQ"
[101] "WOMGRLPQ"    "FOOTWRCQ"   "FOOTWRPQ"   "TRANSCQ"    "TRANSPQ"
[106] "GASMOCQ"     "GASMOPQ"    "HEALTHCQ"   "HEALTHPQ"   "HLTHINCQ"
[111] "HLTHINPQ"    "ENTERTCQ"   "ENTERTPQ"   "PETTOYCQ"   "PETTOYPQ"
[116] "PERSCACQ"    "PERSCAPQ"   "EDUCACQ"    "EDUCAPQ"    "TOBACCCQ"
[121] "TOBACCPQ"    "BUILDING"   "UNISTRQ"    "BUILT"      "HEATFUEL"
[126] "WATERHT"
> model1 <- lm(educ_bach ~ POPSIZE + FSALARYX + Married)
> summary(model1)

```

```

Call:
lm(formula = educ_bach ~ POPSIZE + FSALARYX + Married)

```

```

Residuals:
    Min       1Q   Median       3Q      Max
-0.8930 -0.2032 -0.1682 -0.1043  0.9219

```

```

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  1.524e-01  6.023e-02   2.529  0.01145 *
POPSIZE1     1.588e-02  6.064e-02   0.262  0.79340
POPSIZE2    -6.891e-03  6.089e-02  -0.113  0.90991
POPSIZE3     8.907e-03  6.264e-02   0.142  0.88694
POPSIZE4    -4.072e-02  6.094e-02  -0.668  0.50399
POPSIZE5    -7.428e-02  6.164e-02  -1.205  0.22823
FSALARYX     1.028e-06  8.237e-08  12.480 < 2e-16 ***
Married      2.627e-02  9.831e-03   2.673  0.00754 **
---

```

```

Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

```

Residual standard error: 0.3894 on 6830 degrees of freedom
Multiple R-squared:  0.03755, Adjusted R-squared:  0.03656
F-statistic: 38.06 on 7 and 6830 DF, p-value: < 2.2e-16

```

```

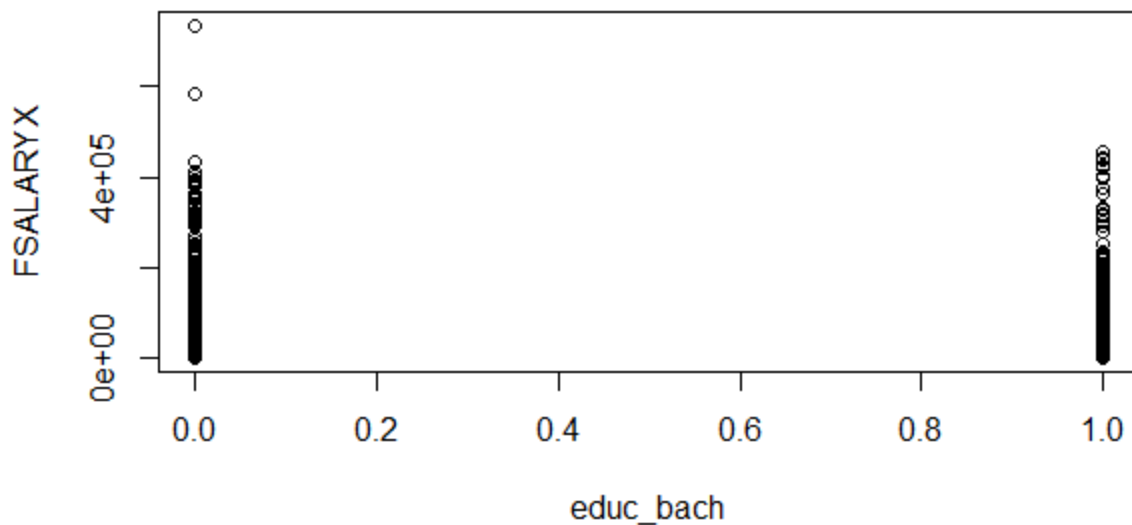
> summary.aov(model1)

```

	Df	Sum Sq	Mean Sq	F value	Pr(>F)	
POPSIZE	5	10.4	2.075	13.683	2.56e-13	***
FSALARYX	1	28.9	28.947	190.880	< 2e-16	***
Married	1	1.1	1.083	7.143	0.00754	**
Residuals	6830	1035.8	0.152			

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

> plot(educ_bach, FSALARYX)



```
fraction_housing <- BBYDAYPQ/FINCATAX
> fraction_babysitting <- BBYDAYPQ/FINCATAX
> model2 <- lm(fraction_babysitting[fraction_babysitting1] ~ AGE_REF[fraction_babysitting1])
> summary(model2)
```

Call:

```
lm(formula = fraction_babysitting[fraction_babysitting1] ~ AGE_REF[fraction_babysitting1])
```

Residuals:

Min	1Q	Median	3Q	Max
-0.125	-0.032	-0.022	-0.012	101.373

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	0.0583520	0.0502176	1.162	0.245
AGE_REF[fraction_babysitting1]	-0.0007181	0.0009407	-0.763	0.445

Residual standard error: 1.307 on 6158 degrees of freedom

Multiple R-squared: 9.462e-05, Adjusted R-squared: -6.776e-05

F-statistic: 0.5827 on 1 and 6158 DF, p-value: 0.4453

> summary(model2)

```
Call:
lm(formula = fraction_babysitting[fraction_babysitting1] ~ AGE_REF[fraction_babysitting1])
```

Residuals:

Min	1Q	Median	3Q	Max
-0.125	-0.032	-0.022	-0.012	101.373

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	0.0583520	0.0502176	1.162	0.245
AGE_REF[fraction_babysitting1]	-0.0007181	0.0009407	-0.763	0.445

Residual standard error: 1.307 on 6158 degrees of freedom

Multiple R-squared: 9.462e-05, Adjusted R-squared: -6.776e-05

F-statistic: 0.5827 on 1 and 6158 DF, p-value: 0.4453

```
> anova(model2)
```

Analysis of Variance Table

Response: fraction_babysitting[fraction_babysitting1]

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
AGE_REF[fraction_babysitting1]	1	1	0.99502	0.5827	0.4453
Residuals	6158	10515	1.70758		

```
> coefficients(model2)
```

	(Intercept)	AGE_REF[fraction_babysitting1]
	0.0583519688	-0.0007180643

```
> vcov(model2)
```

	(Intercept)	AGE_REF[fraction_babysitting1]
(Intercept)	2.521807e-03	-4.456634e-05
AGE_REF[fraction_babysitting1]	-4.456634e-05	8.848599e-07

```
> summary(fitted.values(model2))
```

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
-0.00412	0.01311	0.02245	0.02219	0.03250	0.04686

%Insurance less than	No HS	HS diploma	Some college, no degree	Assoc degree	Bach degree	Adv degree
10%	467	1385	1191	615	1181	521
11% - 20%	82	231	157	71	122	58
21% - 30%	21	65	27	10	32	7
more than 30%	8	18	14	1	3	2

A. Conditional on the reference person having a (Associate's, Bachelor's or Advanced), what fraction devote more than 20% of spending to health insurance?

2.096836

B. Conditional on the reference person having less than a college degree, what fraction spend more than 20% on health insurance? 4.173486

C. Is this difference statistically significant? Yes. T Test
4.9

D. What is the overall share (in this sample) of people with any college degree? What share of people spending more than 20% is made up of people with any college degree? 72, 36

e. Are those break points (+/- 20%; any degree) reasonable? Can you suggest better? Explain.

f. What problems might there be, with the classification and analysis here? Can you do better with the CEX data?