

Big Data: HW2

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1 Data Visualization

1.1 Income & Education

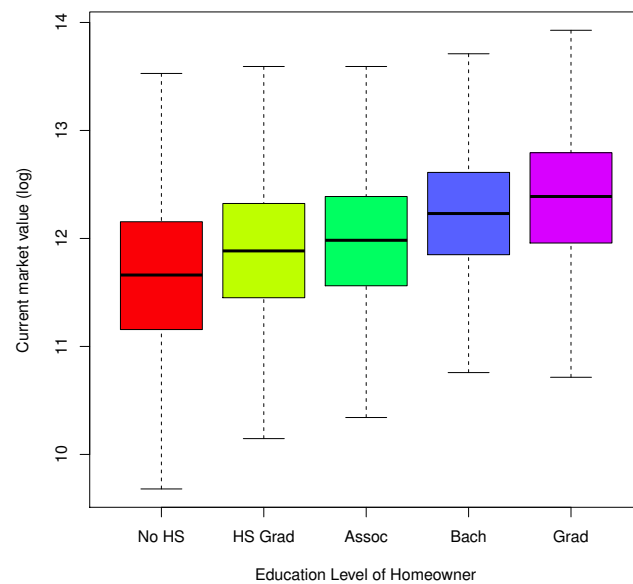


Figure 1:

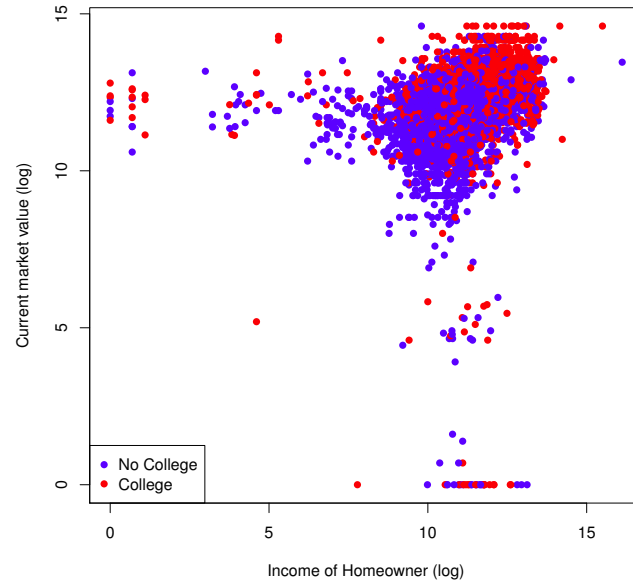


Figure 2:

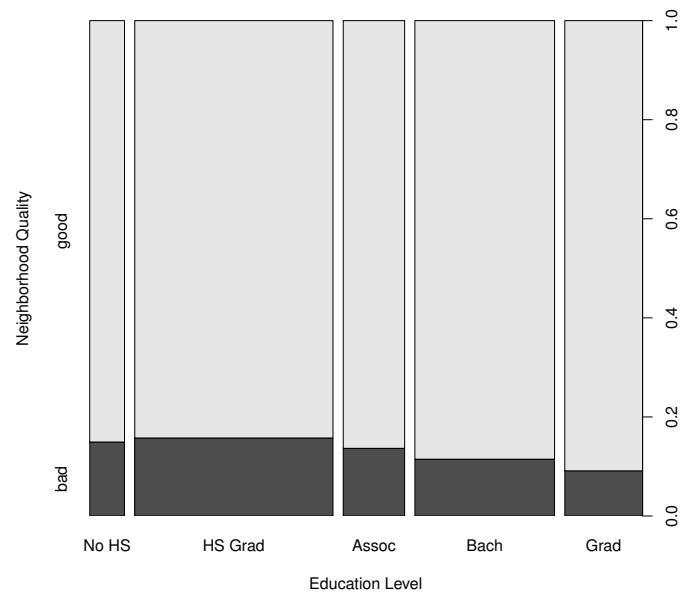


Figure 3:

1.2 Neighborhood & Home

1.3 First-time Buyers & Financing Source

2 Linear Model

3 Logit Model

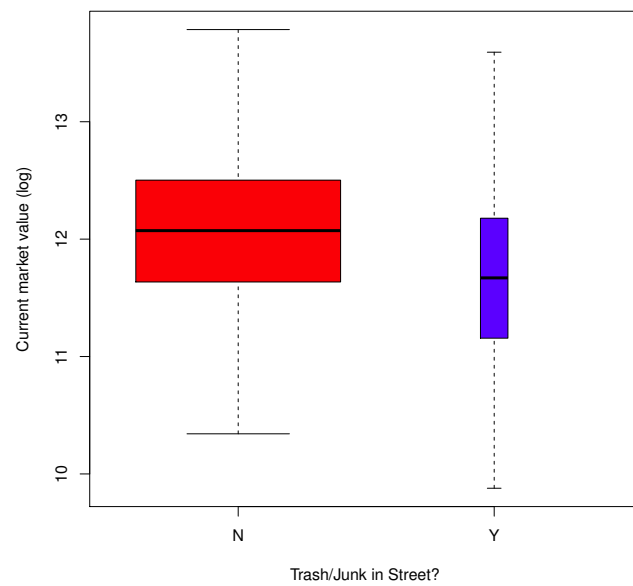


Figure 4:

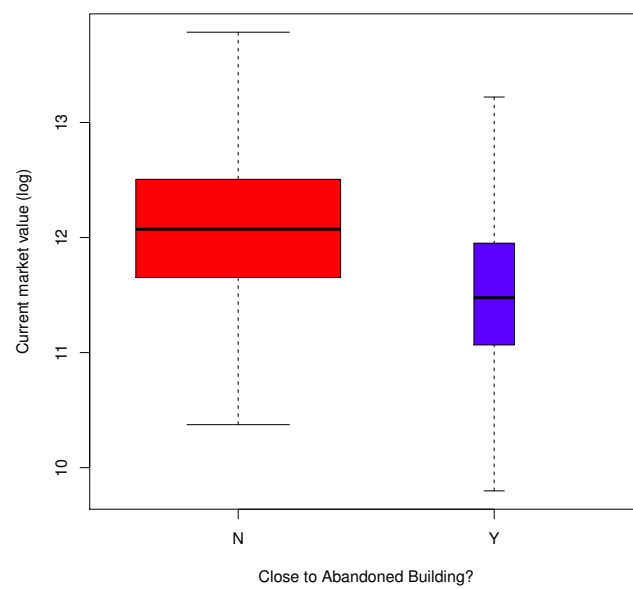


Figure 5:

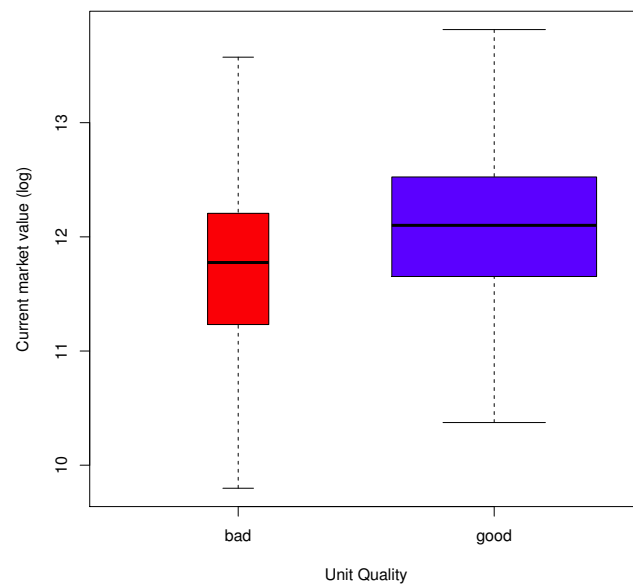


Figure 6:

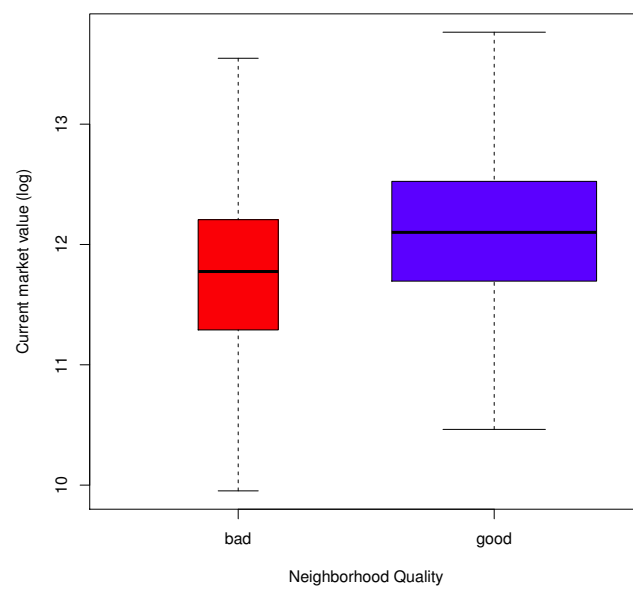


Figure 7:

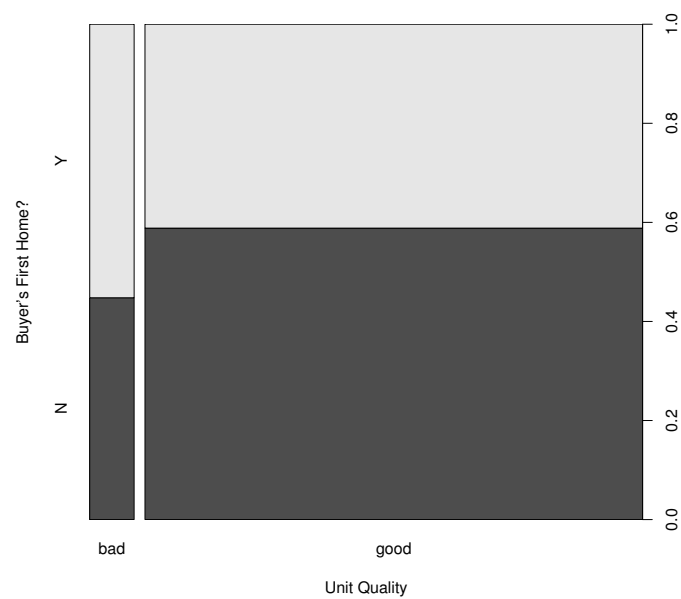


Figure 8:

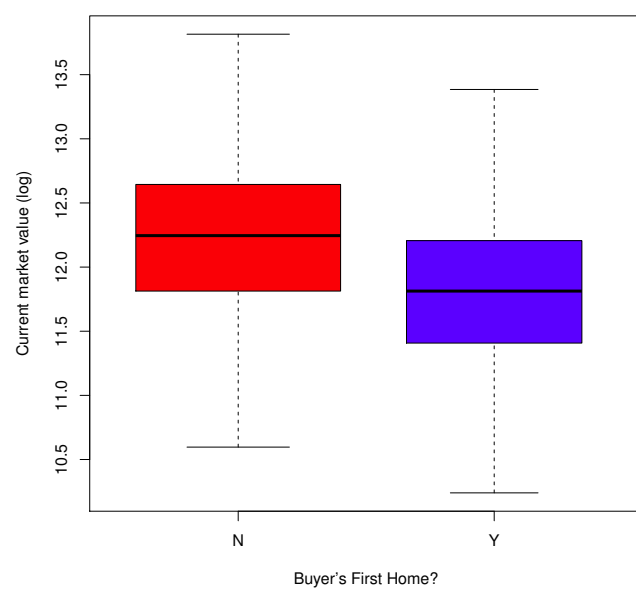


Figure 9:

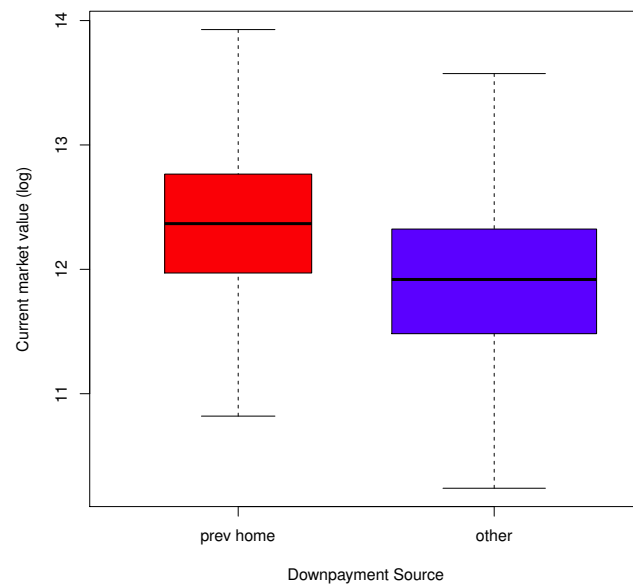


Figure 10:

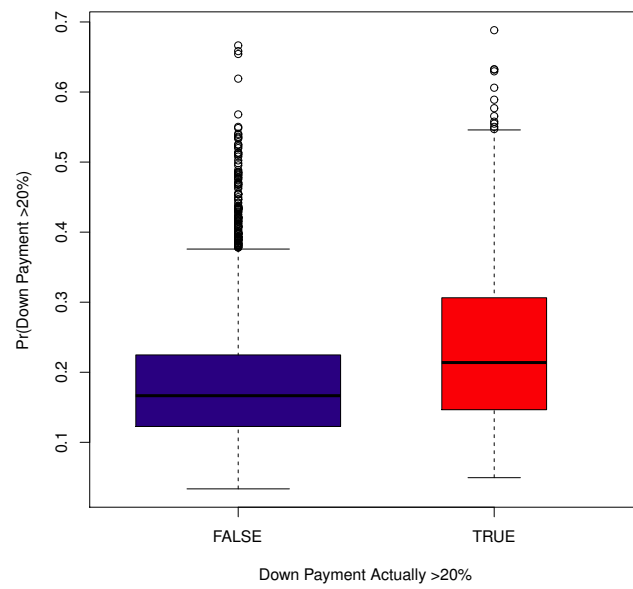


Figure 11:

| | Estimate | Std. Error | t value | Pr(> t) |
|-------------------|----------|------------|---------|----------|
| (Intercept) | 11.5901 | 0.0606 | 191.21 | 0.0000 |
| EAPTBLY | -0.0446 | 0.0221 | -2.02 | 0.0436 |
| ECOM2Y | -0.0985 | 0.0470 | -2.10 | 0.0361 |
| EJUNKY | -0.1258 | 0.0509 | -2.47 | 0.0134 |
| ESFDY | 0.2884 | 0.0292 | 9.86 | 0.0000 |
| EABANY | -0.1633 | 0.0359 | -4.55 | 0.0000 |
| HOWHgood | 0.1292 | 0.0263 | 4.92 | 0.0000 |
| HOWNgood | 0.1197 | 0.0219 | 5.47 | 0.0000 |
| STRNAY | -0.0391 | 0.0158 | -2.47 | 0.0136 |
| ZINC2 | 0.0000 | 0.0000 | 11.24 | 0.0000 |
| HHGRADBach | 0.1333 | 0.0229 | 5.82 | 0.0000 |
| HHGRADGrad | 0.1979 | 0.0257 | 7.69 | 0.0000 |
| ‘HHGRADHS Grad’ | -0.0615 | 0.0217 | -2.84 | 0.0046 |
| ‘HHGRADNo HS’ | -0.1971 | 0.0318 | -6.20 | 0.0000 |
| NUNITS | -0.0010 | 0.0005 | -1.87 | 0.0610 |
| INTW | -0.0469 | 0.0044 | -10.66 | 0.0000 |
| METROurban | 0.0837 | 0.0179 | 4.67 | 0.0000 |
| STATECO | -0.2876 | 0.0290 | -9.91 | 0.0000 |
| STATECT | -0.3444 | 0.0312 | -11.04 | 0.0000 |
| STATEGA | -0.6555 | 0.0309 | -21.20 | 0.0000 |
| STATEIL | -0.8624 | 0.0576 | -14.96 | 0.0000 |
| STATEIN | -0.7779 | 0.0307 | -25.37 | 0.0000 |
| STATELA | -0.7218 | 0.0368 | -19.63 | 0.0000 |
| STATEMO | -0.6647 | 0.0334 | -19.89 | 0.0000 |
| STATEOH | -0.6762 | 0.0326 | -20.73 | 0.0000 |
| STATEOK | -0.9978 | 0.0328 | -30.43 | 0.0000 |
| STATEPA | -0.8681 | 0.0338 | -25.67 | 0.0000 |
| STATETX | -1.0497 | 0.0343 | -30.64 | 0.0000 |
| STATEWA | -0.1203 | 0.0309 | -3.89 | 0.0001 |
| BATHS | 0.2134 | 0.0116 | 18.46 | 0.0000 |
| BEDRMS | 0.0877 | 0.0094 | 9.35 | 0.0000 |
| MATBUY | -0.0277 | 0.0136 | -2.03 | 0.0421 |
| ‘DWNPAYprev home’ | 0.1215 | 0.0178 | 6.81 | 0.0000 |
| FRSTHOY | -0.0829 | 0.0172 | -4.82 | 0.0000 |

Table 1: Value of Purchased Homes (in logs)

| | Estimate | Std. Error | t value | Pr(> t) |
|-------------------|----------|------------|---------|----------|
| (Intercept) | 0.1925 | 0.0261 | 7.37 | 0.0000 |
| ECOM1Y | -0.0285 | 0.0096 | -2.96 | 0.0031 |
| ECOM2Y | -0.0439 | 0.0248 | -1.77 | 0.0763 |
| ESFDY | -0.0566 | 0.0151 | -3.74 | 0.0002 |
| HOWNgood | 0.0166 | 0.0105 | 1.59 | 0.1122 |
| STRNAY | -0.0164 | 0.0083 | -1.97 | 0.0489 |
| PER | -0.0208 | 0.0025 | -8.34 | 0.0000 |
| HHGRADBach | 0.0354 | 0.0082 | 4.31 | 0.0000 |
| HHGRADGrad | 0.0563 | 0.0103 | 5.45 | 0.0000 |
| INTW | -0.0094 | 0.0023 | -4.11 | 0.0000 |
| STATECT | 0.1423 | 0.0128 | 11.08 | 0.0000 |
| STATEGA | -0.0476 | 0.0130 | -3.66 | 0.0003 |
| STATEIL | 0.1045 | 0.0286 | 3.66 | 0.0003 |
| STATEIN | 0.0332 | 0.0127 | 2.61 | 0.0091 |
| STATELA | 0.0953 | 0.0166 | 5.73 | 0.0000 |
| STATEMO | 0.0926 | 0.0146 | 6.36 | 0.0000 |
| STATEOH | 0.1342 | 0.0139 | 9.63 | 0.0000 |
| STATEPA | 0.1028 | 0.0148 | 6.96 | 0.0000 |
| STATETX | 0.0406 | 0.0148 | 2.75 | 0.0059 |
| BATHS | 0.0433 | 0.0058 | 7.49 | 0.0000 |
| MATBUYY | 0.0493 | 0.0071 | 6.94 | 0.0000 |
| ‘DWNPAYprev home’ | 0.1605 | 0.0094 | 17.15 | 0.0000 |
| VALUE | 0.0000 | 0.0000 | 12.89 | 0.0000 |
| FRSTHOY | -0.0579 | 0.0090 | -6.43 | 0.0000 |

Table 2: Probability of Down Payment > 20% (No Interaction Terms)

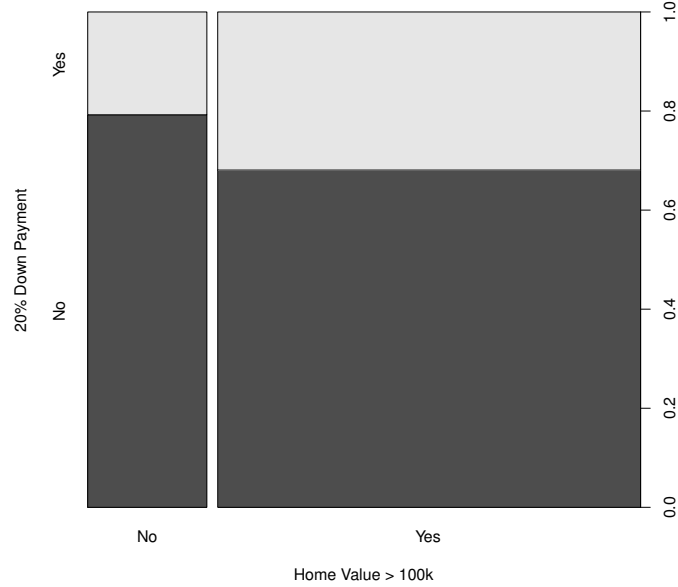


Figure 12:

| | Estimate | Std. Error | t value | Pr(> t) |
|-------------------|----------|------------|---------|----------|
| (Intercept) | 0.1766 | 0.0255 | 6.92 | 0.0000 |
| ECOM1Y | -0.0284 | 0.0096 | -2.94 | 0.0032 |
| ECOM2Y | -0.0449 | 0.0248 | -1.81 | 0.0700 |
| ESFDY | -0.0573 | 0.0151 | -3.79 | 0.0002 |
| HOWNgood | 0.0174 | 0.0105 | 1.67 | 0.0957 |
| STRNAY | -0.0166 | 0.0083 | -1.99 | 0.0462 |
| PER | -0.0208 | 0.0025 | -8.35 | 0.0000 |
| HHGRADBach | 0.0358 | 0.0082 | 4.36 | 0.0000 |
| HHGRADGrad | 0.0566 | 0.0103 | 5.48 | 0.0000 |
| INTW | -0.0097 | 0.0023 | -4.22 | 0.0000 |
| STATECT | 0.1411 | 0.0128 | 11.00 | 0.0000 |
| STATEGA | -0.0473 | 0.0130 | -3.64 | 0.0003 |
| STATEIL | 0.1024 | 0.0286 | 3.59 | 0.0003 |
| STATEIN | 0.0324 | 0.0127 | 2.55 | 0.0109 |
| STATELA | 0.0955 | 0.0166 | 5.74 | 0.0000 |
| STATEMO | 0.0910 | 0.0145 | 6.25 | 0.0000 |
| STATEOH | 0.1324 | 0.0139 | 9.50 | 0.0000 |
| STATEPA | 0.0999 | 0.0148 | 6.77 | 0.0000 |
| STATETX | 0.0397 | 0.0147 | 2.69 | 0.0071 |
| BATHS | 0.0556 | 0.0058 | 9.52 | 0.0000 |
| MATBUYY | 0.0493 | 0.0071 | 6.95 | 0.0000 |
| ‘DWNPAYprev home’ | 0.1553 | 0.0092 | 16.84 | 0.0000 |
| VALUE | 0.0000 | 0.0000 | 12.35 | 0.0000 |
| ‘BATHS:FRSTHOY’ | -0.0367 | 0.0047 | -7.75 | 0.0000 |

Table 3: Probability of Down Payment > 20% (With Interaction Term)

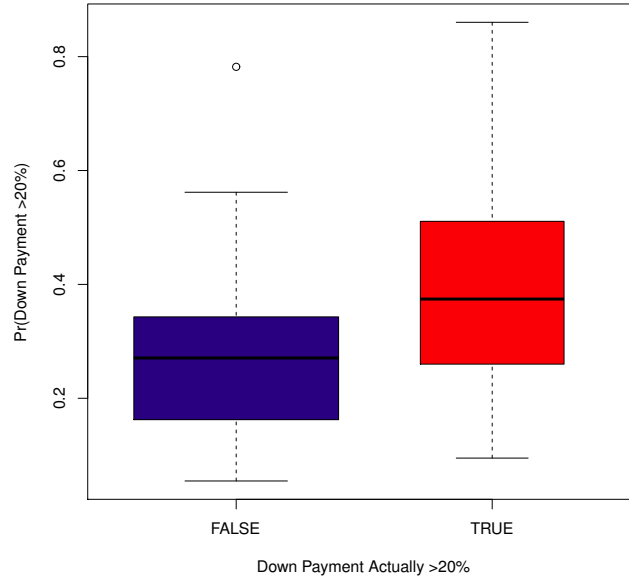


Figure 13: