Final\_Project

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## Data Source

[click here view the data source on github](https://github.com/dcgerard/stat_415_615/blob/main/lectures/data/estate.csv)

## Brief Description of the dataset:

This dataset is about 522 home sales in a Midwestern city during the year 2002. The goal here is to predict residential home sales prices from the other variables.

The 13 variables are described below:

* price: Sales price of residence (in dollars)
* area: Finished area of residence (in square feet)
* bed: Total number of bedrooms in residence
* bath: Total number of bathrooms in residence
* ac: “yes” = presence of air conditioning, “no” = absence of air conditioning
* garage: Number of cars that a garage will hold
* pool: “yes” = presence of a pool, “no” = absence of a pool
* year: Year property was originally constructed
* quality: Index for quality of construction. high, medium, or low.
* style: Categorical variable indicating architectural style
* lot: Lot size (in square feet)
* highway: “yes” = highway adjacent, “no” = highway not adjacent.

# Lets download the data for this project from the Internet

# Set the URL of the CSV file to download  
url <- "https://dcgerard.github.io/stat\_415\_615/data/estate.csv"  
  
# Check if a folder named "data" exists in the current working directory  
if (!file.exists("data")) {  
 # If it doesn't exist, create it  
 dir.create("data")  
}  
  
# Set the file path for the downloaded CSV file  
file\_path <- file.path("data", "estate.csv")  
  
# Download the CSV file from the specified URL and save it to the file path  
download.file(url, file\_path, method = "auto")

## Warning in download.file(url, file\_path, method = "auto"): URL  
## https://dcgerard.github.io/stat\_415\_615/data/estate.csv: cannot open destfile  
## 'data/estate.csv', reason 'Permission denied'

## Warning in download.file(url, file\_path, method = "auto"): download had nonzero  
## exit status

# Read the CSV file into R  
estate <- read.csv(file\_path)  
  
# View the first few rows of the data to confirm that it was loaded correctly  
head(estate)

## id price area bed bath ac garage pool year quality style lot highway  
## 1 1 360000 3032 4 4 yes 2 no 1972 medium 1 22221 no  
## 2 2 340000 2058 4 2 yes 2 no 1976 medium 1 22912 no  
## 3 3 250000 1780 4 3 yes 2 no 1980 medium 1 21345 no  
## 4 4 205500 1638 4 2 yes 2 no 1963 medium 1 17342 no  
## 5 5 275500 2196 4 3 yes 2 no 1968 medium 7 21786 no  
## 6 6 248000 1966 4 3 yes 5 yes 1972 medium 1 18902 no

estate2 <- estate %>%   
 select(price, area, quality, style, lot, ac)  
estate2

## price area quality style lot ac  
## 1 360000 3032 medium 1 22221 yes  
## 2 340000 2058 medium 1 22912 yes  
## 3 250000 1780 medium 1 21345 yes  
## 4 205500 1638 medium 1 17342 yes  
## 5 275500 2196 medium 7 21786 yes  
## 6 248000 1966 medium 1 18902 yes  
## 7 229900 2216 medium 7 18639 yes  
## 8 150000 1597 medium 1 22112 yes  
## 9 195000 1622 low 1 14321 yes  
## 10 160000 1976 low 1 32358 no  
## 11 190000 2812 low 7 56639 no  
## 12 559000 2791 high 1 30595 yes  
## 13 535000 3381 high 7 23172 yes  
## 14 525000 3459 high 5 35351 yes  
## 15 299900 2090 medium 1 24025 yes  
## 16 527000 3232 medium 6 21445 yes  
## 17 169900 1502 medium 1 28958 yes  
## 18 335250 2747 medium 7 22241 yes  
## 19 323900 2890 medium 7 41992 yes  
## 20 200000 1825 medium 1 30266 yes  
## 21 211000 1578 medium 2 18829 yes  
## 22 212000 1763 medium 1 24726 yes  
## 23 245000 2517 medium 1 23261 yes  
## 24 140400 1872 medium 3 24017 yes  
## 25 295000 3266 medium 6 24881 yes  
## 26 170900 2020 medium 1 21385 yes  
## 27 229000 2164 medium 1 28291 yes  
## 28 218500 2080 medium 1 14752 yes  
## 29 160000 2208 medium 7 8058 yes  
## 30 259000 3048 medium 7 29307 yes  
## 31 164500 1460 medium 1 9999 yes  
## 32 280000 2540 medium 5 42428 no  
## 33 154000 2208 medium 7 6746 yes  
## 34 272000 2560 medium 5 36100 yes  
## 35 180000 2061 medium 1 20138 no  
## 36 157500 1980 medium 1 32519 yes  
## 37 242500 3308 medium 5 47323 yes  
## 38 182000 2616 low 5 11123 no  
## 39 178000 1460 low 1 27095 yes  
## 40 171900 1580 low 4 12417 no  
## 41 165500 1460 low 1 22493 yes  
## 42 183500 1540 low 3 15801 yes  
## 43 135000 1388 low 1 26106 no  
## 44 175000 1624 low 1 39219 yes  
## 45 149500 1580 low 1 11166 yes  
## 46 177500 1820 low 1 22104 yes  
## 47 155000 1733 low 4 22398 yes  
## 48 145000 1896 low 6 32753 no  
## 49 178000 2038 low 7 47884 no  
## 50 156000 1436 low 1 43594 no  
## 51 159000 1690 low 5 28518 no  
## 52 160000 1496 low 5 43335 no  
## 53 112000 1668 low 1 19612 no  
## 54 84000 980 low 1 17686 no  
## 55 155000 2562 low 7 40800 no  
## 56 360000 2304 medium 1 70240 yes  
## 57 104000 1268 low 1 21067 no  
## 58 420000 2283 high 1 18524 yes  
## 59 355000 2060 medium 1 38623 yes  
## 60 165000 2087 medium 1 24764 yes  
## 61 244000 2081 medium 3 24993 yes  
## 62 179900 1696 medium 2 22294 yes  
## 63 253000 2222 medium 1 71527 no  
## 64 200000 2110 medium 1 15332 yes  
## 65 200000 1774 low 1 15528 no  
## 66 147700 1592 low 1 11221 yes  
## 67 188700 1748 low 1 23939 yes  
## 68 177000 1985 low 1 69975 no  
## 69 585000 2558 high 3 24601 yes  
## 70 549900 4000 high 10 23595 yes  
## 71 675000 3942 high 7 18920 yes  
## 72 830000 3889 high 7 28378 yes  
## 73 920000 3857 high 1 32793 yes  
## 74 855000 4756 high 7 22215 yes  
## 75 585500 3302 high 7 26463 yes  
## 76 399000 2629 high 9 24778 yes  
## 77 790000 4418 high 7 22024 yes  
## 78 665000 4746 high 7 23368 yes  
## 79 725000 3242 high 1 27173 yes  
## 80 647000 2464 high 1 31703 yes  
## 81 780000 4419 high 1 56127 yes  
## 82 657500 3877 high 7 24639 yes  
## 83 578000 3808 high 7 23324 yes  
## 84 500000 3376 high 7 18452 yes  
## 85 484530 2940 high 7 20639 yes  
## 86 609000 2654 high 1 12821 yes  
## 87 635000 2672 high 1 28049 yes  
## 88 519000 3386 high 7 24008 yes  
## 89 625100 3648 high 7 26604 yes  
## 90 585444 3455 high 7 22468 yes  
## 91 399900 3321 high 7 15012 yes  
## 92 389900 2817 high 7 31214 yes  
## 93 649000 3210 high 1 30033 yes  
## 94 535000 3588 high 7 22530 yes  
## 95 640000 2705 high 1 22196 yes  
## 96 600000 2344 high 1 86004 yes  
## 97 582500 4264 high 7 24983 yes  
## 98 545000 2615 high 1 21722 yes  
## 99 480000 3608 high 7 25219 yes  
## 100 595000 2479 high 1 29805 yes  
## 101 610000 3251 high 1 25570 yes  
## 102 570000 2547 high 1 21789 yes  
## 103 479000 5032 high 7 22000 yes  
## 104 545000 4973 high 7 56139 yes  
## 105 335000 2582 high 2 23256 yes  
## 106 629000 3139 high 1 21810 yes  
## 107 505500 3516 high 7 19867 yes  
## 108 528750 2129 high 1 37414 yes  
## 109 370000 2936 high 7 16437 yes  
## 110 529000 3351 high 7 24216 yes  
## 111 490000 3136 high 7 27158 yes  
## 112 535000 3525 high 7 27501 yes  
## 113 612000 3917 high 7 37972 yes  
## 114 442500 2702 high 1 39643 yes  
## 115 500000 3644 high 7 21895 yes  
## 116 539000 3072 high 1 25158 yes  
## 117 545500 3233 high 7 22961 yes  
## 118 424000 2918 high 7 22003 yes  
## 119 325000 3266 high 7 16640 yes  
## 120 367000 2940 high 7 22003 yes  
## 121 470000 3430 high 7 25018 yes  
## 122 393000 2472 high 1 21784 yes  
## 123 530000 2878 high 1 68351 yes  
## 124 400000 2537 high 1 11053 yes  
## 125 403500 3858 high 7 22224 yes  
## 126 550000 2742 high 1 22306 yes  
## 127 380000 3460 high 1 18571 yes  
## 128 500000 3836 high 5 48465 yes  
## 129 465000 4453 high 7 15595 yes  
## 130 451500 4080 high 7 22134 yes  
## 131 336000 3301 high 3 18741 yes  
## 132 550000 3828 high 1 17051 yes  
## 133 450000 2973 medium 7 21999 yes  
## 134 440000 2821 medium 1 32914 yes  
## 135 515000 2950 medium 1 21598 yes  
## 136 415000 2362 medium 3 21604 yes  
## 137 380000 3092 medium 3 20081 yes  
## 138 489500 2866 medium 7 22424 no  
## 139 478000 3369 medium 7 21161 yes  
## 140 460000 3068 medium 7 18289 yes  
## 141 379900 2380 medium 1 21999 yes  
## 142 390000 2225 medium 1 38722 yes  
## 143 338000 2655 medium 1 21960 yes  
## 144 675000 3855 medium 7 35845 yes  
## 145 440000 2892 medium 6 35839 yes  
## 146 500000 3832 medium 1 28722 yes  
## 147 470000 3164 medium 7 20505 yes  
## 148 317500 2620 medium 7 12266 yes  
## 149 430000 3076 medium 7 26648 yes  
## 150 430000 4022 medium 7 18429 yes  
## 151 475000 3377 medium 7 22495 yes  
## 152 389000 2858 medium 7 23981 yes  
## 153 400000 3540 medium 7 18012 yes  
## 154 395000 3045 medium 7 34356 yes  
## 155 395000 4150 medium 7 21778 no  
## 156 296000 1778 medium 7 24022 yes  
## 157 387500 2412 medium 3 22676 yes  
## 158 353000 2668 medium 2 18384 yes  
## 159 350000 2274 medium 1 22049 yes  
## 160 437632 2936 medium 5 22844 yes  
## 161 447500 2526 medium 1 28248 yes  
## 162 318500 2449 medium 3 22075 yes  
## 163 352000 3131 medium 7 15209 yes  
## 164 295000 2536 medium 7 39427 yes  
## 165 313500 3314 medium 7 24339 yes  
## 166 330000 2230 medium 1 24798 yes  
## 167 400000 2631 medium 7 44885 no  
## 168 325000 2638 medium 3 25747 yes  
## 169 340000 2756 medium 7 22546 yes  
## 170 399900 3262 medium 7 25541 yes  
## 171 249900 1936 medium 3 12850 yes  
## 172 389000 3148 medium 7 16587 yes  
## 173 364500 2616 medium 7 32655 yes  
## 174 357500 3630 medium 7 23283 yes  
## 175 295000 1954 medium 3 19300 yes  
## 176 274500 1926 medium 7 26418 yes  
## 177 259000 2556 medium 1 80886 yes  
## 178 415000 2282 medium 3 23003 yes  
## 179 443000 3314 medium 7 22012 yes  
## 180 249000 2001 medium 3 23812 yes  
## 181 330000 2607 medium 3 23139 yes  
## 182 291000 2840 medium 7 23079 yes  
## 183 418000 3036 medium 7 33746 no  
## 184 320000 2240 medium 3 18682 yes  
## 185 264000 1788 medium 1 18484 no  
## 186 381000 2620 medium 7 28093 yes  
## 187 250000 1480 medium 3 14230 yes  
## 188 360000 2588 medium 2 19004 yes  
## 189 369500 3138 medium 7 18190 yes  
## 190 285400 2460 medium 7 27492 yes  
## 191 409000 3566 medium 7 18044 yes  
## 192 333000 2692 medium 7 22020 yes  
## 193 362000 2958 medium 7 45200 yes  
## 194 387500 3164 medium 7 23856 yes  
## 195 239000 2058 medium 2 21046 yes  
## 196 299900 2717 medium 7 22083 yes  
## 197 335000 2920 medium 7 22434 yes  
## 198 275000 2554 medium 7 21820 yes  
## 199 328000 2805 medium 7 22582 yes  
## 200 333000 2736 medium 7 29591 yes  
## 201 397000 3516 medium 7 34795 yes  
## 202 374800 3536 medium 7 19997 yes  
## 203 520000 2138 medium 1 86830 yes  
## 204 325000 2718 medium 6 22842 yes  
## 205 295000 2178 medium 1 25891 yes  
## 206 415000 3152 medium 6 24446 yes  
## 207 224900 2611 medium 7 6924 yes  
## 208 265000 2060 medium 2 13091 yes  
## 209 299900 2448 medium 7 26790 yes  
## 210 390000 4050 medium 7 18262 yes  
## 211 271000 2414 medium 7 24357 yes  
## 212 330000 3072 medium 7 16431 yes  
## 213 350000 2525 medium 4 27138 yes  
## 214 310000 2866 medium 7 25249 yes  
## 215 340000 3246 medium 7 52218 yes  
## 216 307000 2707 medium 7 22094 yes  
## 217 304000 2300 medium 3 35824 yes  
## 218 275900 1860 medium 1 40741 yes  
## 219 315000 3636 medium 7 19776 yes  
## 220 295000 1910 medium 1 30996 yes  
## 221 251010 2280 medium 1 25543 yes  
## 222 335000 3386 medium 7 38428 no  
## 223 343500 2324 medium 3 22435 yes  
## 224 297000 1970 medium 3 25814 yes  
## 225 281000 2062 medium 2 23608 yes  
## 226 235000 2617 medium 7 8903 yes  
## 227 237000 2612 medium 7 10144 yes  
## 228 274900 2472 medium 7 22451 yes  
## 229 229900 1922 medium 1 15791 yes  
## 230 259000 1852 medium 3 22204 yes  
## 231 245000 2239 medium 3 22216 yes  
## 232 208000 2068 medium 1 34773 yes  
## 233 421000 2101 medium 1 65499 no  
## 234 320000 2200 medium 1 31450 yes  
## 235 256000 1972 medium 3 32027 no  
## 236 275000 2007 medium 3 21311 yes  
## 237 222000 2612 medium 7 8229 yes  
## 238 249900 2124 medium 2 21834 yes  
## 239 273500 2612 medium 7 8924 yes  
## 240 218500 2548 medium 3 10210 yes  
## 241 377000 2767 medium 4 75232 yes  
## 242 220000 2025 medium 3 19618 yes  
## 243 192900 1956 medium 2 21779 yes  
## 244 298750 2460 medium 3 23907 yes  
## 245 315000 2764 medium 7 23947 yes  
## 246 315000 2004 medium 3 24453 yes  
## 247 465900 2852 medium 7 34040 yes  
## 248 239500 2096 medium 1 15237 yes  
## 249 276000 2330 medium 7 17433 yes  
## 250 226000 2520 medium 7 12145 yes  
## 251 235000 2528 medium 3 26469 yes  
## 252 247000 2030 medium 3 23202 yes  
## 253 182000 2208 medium 7 6734 yes  
## 254 180000 1500 medium 3 39776 yes  
## 255 249000 2078 medium 1 21512 yes  
## 256 260000 2442 medium 2 21149 yes  
## 257 219900 2612 medium 7 11288 yes  
## 258 295000 2268 medium 2 23976 yes  
## 259 290000 2734 medium 7 23488 yes  
## 260 300000 2228 medium 3 21232 yes  
## 261 354900 3000 medium 7 21643 yes  
## 262 261000 2404 medium 2 17791 yes  
## 263 174500 1840 medium 1 16356 yes  
## 264 244900 2107 medium 6 30050 no  
## 265 274900 2788 medium 7 18960 yes  
## 266 214000 2416 medium 3 15594 yes  
## 267 283000 2430 medium 6 18164 yes  
## 268 177900 1584 medium 2 13947 yes  
## 269 237500 1873 medium 3 21998 yes  
## 270 202150 1644 medium 2 19499 yes  
## 271 235000 2400 medium 7 44347 yes  
## 272 217000 2094 medium 3 18617 yes  
## 273 285000 2561 medium 7 18985 yes  
## 274 217500 1752 medium 2 24053 yes  
## 275 210000 1738 medium 3 15206 yes  
## 276 183340 2068 medium 1 24325 yes  
## 277 252000 2428 medium 7 22727 yes  
## 278 237000 2090 medium 1 22055 yes  
## 279 205000 1820 medium 2 28023 yes  
## 280 285000 3219 medium 6 28200 yes  
## 281 210000 2654 medium 1 28882 yes  
## 282 280000 1802 medium 1 27700 yes  
## 283 207000 1765 medium 2 22983 yes  
## 284 221000 2786 medium 7 22875 yes  
## 285 257000 1794 medium 3 21691 yes  
## 286 274000 2768 medium 7 26268 no  
## 287 262000 2288 medium 3 16975 yes  
## 288 204400 2028 medium 1 26777 yes  
## 289 254900 2620 medium 7 27989 yes  
## 290 244000 1644 medium 2 32164 yes  
## 291 213000 1888 medium 1 14757 yes  
## 292 240000 2116 medium 7 22041 yes  
## 293 235000 2313 medium 7 24705 yes  
## 294 206000 1824 medium 1 14748 yes  
## 295 237000 1942 medium 2 23105 yes  
## 296 274000 2184 medium 3 19090 yes  
## 297 275000 2578 medium 7 22299 yes  
## 298 218400 2036 medium 7 21996 yes  
## 299 156000 1384 medium 1 26706 no  
## 300 220000 1826 medium 1 19870 yes  
## 301 171500 1681 medium 1 15985 yes  
## 302 180000 1726 medium 1 26769 yes  
## 303 204000 1910 medium 3 15423 yes  
## 304 307000 2664 medium 7 22684 yes  
## 305 265000 2116 medium 2 33344 yes  
## 306 209900 2030 medium 1 21914 yes  
## 307 173000 1940 medium 3 11610 no  
## 308 189000 1676 medium 3 21780 no  
## 309 222500 2120 medium 1 17883 yes  
## 310 265000 2152 medium 1 26075 yes  
## 311 264670 1984 medium 1 31204 yes  
## 312 200750 1575 medium 1 25543 yes  
## 313 227900 1798 medium 2 17820 yes  
## 314 255000 2017 medium 3 86571 no  
## 315 208500 1904 medium 2 15559 yes  
## 316 226900 1718 medium 2 49613 yes  
## 317 215000 1776 medium 2 22839 no  
## 318 222950 2609 medium 1 26087 yes  
## 319 239900 2226 medium 2 13520 yes  
## 320 176000 1556 medium 3 15623 yes  
## 321 228000 1764 medium 3 8105 yes  
## 322 204900 1626 medium 2 15288 yes  
## 323 258000 2012 medium 2 21303 yes  
## 324 241850 2090 medium 7 22010 yes  
## 325 198500 2192 medium 2 22851 yes  
## 326 243000 2228 medium 7 21881 yes  
## 327 187000 1825 medium 2 15810 yes  
## 328 233000 2132 medium 2 17159 yes  
## 329 205000 2160 medium 7 16555 yes  
## 330 205000 1974 medium 1 26196 yes  
## 331 189000 1696 medium 1 31851 yes  
## 332 204900 2132 medium 7 23986 yes  
## 333 239000 1814 medium 2 24698 yes  
## 334 193000 1796 medium 2 29281 yes  
## 335 260000 2268 medium 3 35240 yes  
## 336 188000 1719 medium 1 22009 yes  
## 337 190500 1704 medium 3 22583 yes  
## 338 230000 2142 medium 1 22223 yes  
## 339 240000 1705 medium 1 42322 yes  
## 340 235000 1752 medium 2 39267 yes  
## 341 275000 2554 medium 7 22381 yes  
## 342 205000 1650 medium 3 27235 yes  
## 343 280000 2816 medium 5 29109 yes  
## 344 190000 1919 medium 7 20093 yes  
## 345 232500 2080 medium 1 32021 yes  
## 346 259500 2108 medium 7 24685 yes  
## 347 275000 2480 medium 1 22144 yes  
## 348 183900 1746 medium 2 52136 yes  
## 349 290000 2703 medium 1 43599 no  
## 350 217950 1640 medium 3 21314 yes  
## 351 220000 2196 medium 7 17899 yes  
## 352 185000 1701 medium 2 21938 yes  
## 353 288000 2250 medium 4 23684 yes  
## 354 197500 2502 medium 6 23749 yes  
## 355 179975 1762 medium 1 15742 yes  
## 356 195000 2016 medium 2 18102 yes  
## 357 228400 1904 medium 2 14945 yes  
## 358 194750 1652 medium 1 24644 yes  
## 359 195000 2042 medium 2 21849 no  
## 360 210000 2019 medium 2 14837 yes  
## 361 239550 2791 medium 4 22863 yes  
## 362 242000 2514 medium 5 17535 yes  
## 363 185000 1746 medium 3 12386 yes  
## 364 175000 1930 medium 2 15923 yes  
## 365 165000 1552 medium 3 27068 yes  
## 366 185000 1566 medium 2 13504 yes  
## 367 173194 1669 medium 2 24643 yes  
## 368 205150 1814 medium 2 18714 yes  
## 369 214200 1794 medium 2 24308 yes  
## 370 182500 1691 medium 2 21961 yes  
## 371 205000 1834 medium 1 30726 yes  
## 372 208000 1984 medium 1 22047 yes  
## 373 225000 1966 medium 1 24871 yes  
## 374 170000 1669 medium 2 21253 yes  
## 375 216000 2132 medium 1 41332 yes  
## 376 180000 2007 medium 3 15992 yes  
## 377 169200 1964 medium 7 18162 yes  
## 378 213000 2325 medium 3 16699 yes  
## 379 210000 2196 medium 7 29329 yes  
## 380 185000 2061 medium 2 25379 yes  
## 381 179900 1828 medium 3 37150 yes  
## 382 196000 1956 medium 1 20486 yes  
## 383 219900 1852 medium 2 20800 yes  
## 384 159900 1795 medium 11 26467 yes  
## 385 170000 1580 low 5 10799 no  
## 386 169900 1708 low 1 11413 no  
## 387 189500 1700 low 1 14023 no  
## 388 195000 1742 low 1 18250 yes  
## 389 215000 1890 low 1 22110 yes  
## 390 171000 1512 low 1 14774 no  
## 391 179900 1840 low 1 40832 no  
## 392 120000 1060 low 1 15001 no  
## 393 175000 1540 low 1 45458 no  
## 394 232900 1550 low 2 14998 yes  
## 395 229900 2787 low 5 39558 yes  
## 396 174900 1528 low 1 25193 yes  
## 397 168900 1928 low 5 26393 no  
## 398 229500 2329 low 7 28179 yes  
## 399 236000 1940 low 1 15073 yes  
## 400 205500 2114 low 7 14526 yes  
## 401 212000 1799 low 2 16210 yes  
## 402 205000 1864 low 1 25628 yes  
## 403 193000 1581 low 1 15064 yes  
## 404 180000 1652 low 3 21875 yes  
## 405 184000 1592 low 1 25943 no  
## 406 144900 1520 low 4 36359 no  
## 407 255000 1792 low 1 31257 yes  
## 408 137000 1464 low 1 14999 no  
## 409 178000 1702 low 1 21898 no  
## 410 296000 2180 low 1 29617 yes  
## 411 186500 1486 low 1 18479 yes  
## 412 170000 1364 low 1 26369 no  
## 413 219000 1540 low 2 30691 yes  
## 414 188000 1608 low 2 19380 yes  
## 415 195250 1668 low 3 17060 yes  
## 416 175000 1944 low 1 43562 yes  
## 417 215000 1883 low 1 19932 yes  
## 418 197500 2215 low 6 25540 no  
## 419 249900 1916 low 1 20576 yes  
## 420 180000 1508 low 1 32469 yes  
## 421 174900 1809 low 2 16782 yes  
## 422 189900 1958 low 5 22788 no  
## 423 154000 1592 low 1 10332 yes  
## 424 150000 1636 low 1 10000 yes  
## 425 189900 1800 low 2 13566 no  
## 426 157000 1600 low 5 10807 no  
## 427 182000 1550 low 1 15100 yes  
## 428 187650 1578 low 1 14631 yes  
## 429 175000 1644 low 1 12999 yes  
## 430 189900 1556 low 3 19840 yes  
## 431 175000 1672 low 1 22617 yes  
## 432 159900 1650 low 1 14997 yes  
## 433 184900 1676 low 1 16156 no  
## 434 174900 1960 low 1 16953 no  
## 435 143000 1649 low 5 20096 yes  
## 436 164900 1728 low 4 10999 yes  
## 437 173500 1586 low 1 15862 yes  
## 438 161800 1592 low 1 18686 no  
## 439 148000 1514 low 1 16209 yes  
## 440 177000 1952 low 1 24377 yes  
## 441 149900 1550 low 1 14311 yes  
## 442 170000 1544 low 1 14942 no  
## 443 142000 1566 low 1 15228 no  
## 444 186900 1650 low 1 22000 yes  
## 445 152900 1392 low 1 29199 no  
## 446 350000 2981 low 6 49756 yes  
## 447 130000 1412 low 1 16752 no  
## 448 167900 2180 low 3 15001 no  
## 449 184900 1704 low 1 16759 yes  
## 450 178000 1600 low 3 15090 yes  
## 451 111000 1276 low 1 11554 no  
## 452 207000 1666 low 1 39523 no  
## 453 190000 1760 low 2 20193 yes  
## 454 230000 1836 low 1 46339 no  
## 455 165000 1636 low 1 20125 no  
## 456 210000 1748 low 1 14512 yes  
## 457 226000 2556 low 6 36276 no  
## 458 149900 1511 low 1 14821 yes  
## 459 155000 1524 low 1 21875 yes  
## 460 219900 1821 low 1 16696 yes  
## 461 132000 1596 low 1 28357 no  
## 462 195000 2392 low 1 30265 no  
## 463 155900 1748 low 1 16231 yes  
## 464 119900 1384 low 1 30002 no  
## 465 175000 1628 low 1 17069 yes  
## 466 304000 1911 low 1 86248 yes  
## 467 190000 1624 low 3 15002 no  
## 468 229100 1956 low 6 14710 yes  
## 469 187500 2012 low 5 14925 no  
## 470 173000 1590 low 1 22336 yes  
## 471 170000 1687 low 4 20925 yes  
## 472 179000 1816 low 3 16508 yes  
## 473 162500 1622 low 3 16120 yes  
## 474 172000 1604 low 1 14964 yes  
## 475 153200 1592 low 1 16396 no  
## 476 220000 1922 low 1 33579 yes  
## 477 174000 1892 low 3 14712 yes  
## 478 200000 1628 low 1 15412 yes  
## 479 161000 1644 low 1 17030 yes  
## 480 135000 1450 low 1 15868 yes  
## 481 190000 1592 low 1 22748 yes  
## 482 153800 1654 low 1 25874 no  
## 483 144900 1388 low 1 10568 yes  
## 484 165000 1670 low 1 18525 no  
## 485 186000 1953 low 1 17129 yes  
## 486 167000 2008 low 1 21860 yes  
## 487 189600 1650 low 1 34724 yes  
## 488 170000 1578 low 1 22485 yes  
## 489 189500 1618 low 1 27539 yes  
## 490 153500 1642 low 1 14901 no  
## 491 159900 2008 low 1 31657 yes  
## 492 158000 1604 low 1 23534 yes  
## 493 175000 2035 low 7 20131 yes  
## 494 147000 1534 low 3 15361 no  
## 495 155000 1624 low 1 16721 yes  
## 496 150000 1700 low 1 15391 yes  
## 497 165000 1630 low 2 24963 yes  
## 498 147000 1526 low 1 15007 yes  
## 499 146250 1672 low 1 22617 yes  
## 500 177500 1588 low 2 21925 yes  
## 501 153650 1752 low 6 9126 yes  
## 502 199500 1674 low 1 33237 no  
## 503 186000 1980 low 6 47679 no  
## 504 139900 1396 low 1 25879 no  
## 505 160000 1178 low 1 9941 no  
## 506 125000 1263 low 1 12357 no  
## 507 359900 2377 low 6 51005 yes  
## 508 184500 1304 low 1 21305 yes  
## 509 155000 1340 low 1 5666 no  
## 510 150000 1559 low 1 23999 no  
## 511 146000 1412 low 1 4560 yes  
## 512 129000 1198 low 1 20918 yes  
## 513 145000 1424 low 1 16414 yes  
## 514 200000 1370 low 4 8000 no  
## 515 149900 1584 low 1 13514 yes  
## 516 132000 1567 low 4 12249 yes  
## 517 136900 1409 low 1 28421 no  
## 518 137000 1655 low 1 54651 no  
## 519 185000 1944 low 6 17999 yes  
## 520 133500 1922 low 1 14805 no  
## 521 124000 1480 low 1 28351 yes  
## 522 95500 1184 low 1 14786 no

model <- lm(price ~ area + ac + quality + style + lot , estate2)  
model

##   
## Call:  
## lm(formula = price ~ area + ac + quality + style + lot, data = estate2)  
##   
## Coefficients:  
## (Intercept) area acyes qualitylow qualitymedium   
## 1.485e+05 1.130e+02 1.609e+04 -1.876e+05 -1.559e+05   
## style lot   
## -6.237e+03 1.109e+00

summary(model)

##   
## Call:  
## lm(formula = price ~ area + ac + quality + style + lot, data = estate2)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -234777 -32546 -3126 25053 289552   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 1.485e+05 2.219e+04 6.693 5.72e-11 \*\*\*  
## area 1.130e+02 6.671e+00 16.933 < 2e-16 \*\*\*  
## acyes 1.609e+04 8.106e+03 1.985 0.0477 \*   
## qualitylow -1.876e+05 1.307e+04 -14.356 < 2e-16 \*\*\*  
## qualitymedium -1.559e+05 1.025e+04 -15.214 < 2e-16 \*\*\*  
## style -6.237e+03 1.393e+03 -4.477 9.33e-06 \*\*\*  
## lot 1.109e+00 2.379e-01 4.664 3.96e-06 \*\*\*  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 60840 on 515 degrees of freedom  
## Multiple R-squared: 0.8077, Adjusted R-squared: 0.8054   
## F-statistic: 360.4 on 6 and 515 DF, p-value: < 2.2e-16