Dimensionality Reduction

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Load the kc_housing_data.csv file.

```
df <- read.csv("kc_house_data.csv")
str(df)
```

```
## 'data.frame':    21613 obs. of  21 variables:
##  $ id           : num  7.13e+09 6.41e+09 5.63e+09 2.49e+09 1.95e+09 ...
##  $ date         : chr  "20141013T000000" "20141209T000000" "20150225T000000" "20141209T000000" ...
##  $ price        : num  221900 538000 180000 604000 510000 ...
##  $ bedrooms     : int  3 3 2 4 3 4 3 3 3 3 ...
##  $ bathrooms    : num  1 2.25 1 3 2 4.5 2.25 1.5 1 2.5 ...
##  $ sqft_living  : int  1180 2570 770 1960 1680 5420 1715 1060 1780 1890 ...
##  $ sqft_lot     : int  5650 7242 10000 5000 8080 101930 6819 9711 7470 6560 ...
##  $ floors       : num  1 2 1 1 1 1 2 1 1 2 ...
##  $ waterfront   : int  0 0 0 0 0 0 0 0 0 0 ...
##  $ view         : int  0 0 0 0 0 0 0 0 0 0 ...
##  $ condition    : int  3 3 3 5 3 3 3 3 3 3 ...
##  $ grade        : int  7 7 6 7 8 11 7 7 7 7 ...
##  $ sqft_above   : int  1180 2170 770 1050 1680 3890 1715 1060 1050 1890 ...
##  $ sqft_basement: int  0 400 0 910 0 1530 0 0 730 0 ...
##  $ yr_built     : int  1955 1951 1933 1965 1987 2001 1995 1963 1960 2003 ...
##  $ yr_renovated : int  0 1991 0 0 0 0 0 0 0 0 ...
##  $ zipcode      : int  98178 98125 98028 98136 98074 98053 98003 98198 98146 98038 ...
##  $ lat          : num  47.5 47.7 47.7 47.5 47.6 ...
##  $ long         : num  -122 -122 -122 -122 -122 ...
##  $ sqft_living15: int  1340 1690 2720 1360 1800 4760 2238 1650 1780 2390 ...
##  $ sqft_lot15   : int  5650 7639 8062 5000 7503 101930 6819 9711 8113 7570 ...
```

Simplify variables.

```
df<-df[-c(1,2,8,14:21)]
str(df)
```

```
## 'data.frame':    21613 obs. of  10 variables:
##  $ price      : num  221900 538000 180000 604000 510000 ...
##  $ bedrooms   : int  3 3 2 4 3 4 3 3 3 3 ...
##  $ bathrooms  : num  1 2.25 1 3 2 4.5 2.25 1.5 1 2.5 ...
##  $ sqft_living: int  1180 2570 770 1960 1680 5420 1715 1060 1780 1890 ...
##  $ sqft_lot   : int  5650 7242 10000 5000 8080 101930 6819 9711 7470 6560 ...
##  $ waterfront : int  0 0 0 0 0 0 0 0 0 0 ...
```

```
## $ view        : int  0 0 0 0 0 0 0 0 0 0 ...
## $ condition   : int  3 3 3 5 3 3 3 3 3 3 ...
## $ grade       : int  7 7 6 7 8 11 7 7 7 7 ...
## $ sqft_above  : int  1180 2170 770 1050 1680 3890 1715 1060 1050 1890 ...
```

Check for null values.

```
sapply(df, function(x) sum(is.na(x)))
```

```
##         price      bedrooms     bathrooms sqft_living      sqft_lot  waterfront
##             0             0             0            0             0           0
##          view     condition         grade  sqft_above
##             0             0             0            0
```

Divide into 80/20 train/test.

```
set.seed(12345)
i <- sample(1:nrow(df), nrow(df)*.8, replace=FALSE)
train <- df[i,]
test <- df[-i,]
```

#PCA Reduction

```
library(caret)
```

```
## Loading required package: ggplot2
```

```
## Loading required package: lattice
```

```
library(dplyr)
```

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag
```

```
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
pca_out <-preProcess(train[,2:10], method=c("center", "scale", "pca"))
pca_out
```

```
## Created from 17290 samples and 9 variables
##
## Pre-processing:
##   - centered (9)
##   - ignored (0)
##   - principal component signal extraction (9)
##   - scaled (9)
##
## PCA needed 7 components to capture 95 percent of the variance
```

```r
train_pc <- predict(pca_out,train[,2:10])
test_pc <- predict(pca_out, test[,])
train_df <- data.frame(train_pc$PC1, train_pc$PC2, train_pc$PC3, train_pc$PC4, train_pc$PC5,
                       train_pc$PC6, train_pc$PC7, train$price)
test_df <- data.frame(test_pc$PC1, test_pc$PC2, test_pc$PC3, test_pc$PC4, test_pc$PC5,
                      test_pc$PC6, test_pc$PC7, test$price)
lm1 <- lm(train$price~train_pc$PC1+train_pc$PC2+train_pc$PC3+train_pc$PC4+train_pc$PC5+
                      train_pc$PC6+train_pc$PC7, data=train_df)
rename(test_df, train.price = test.price, train_pc.PC1 = test_pc.PC1, train_pc.PC2 = test_pc.PC2, train_
```

```
##    train_pc.PC1  train_pc.PC2  train_pc.PC3  train_pc.PC4  train_pc.PC5
## 1  -0.559728667 -0.3121797823  0.6353716411  2.198223e-01 -0.1411868277
## 2  -0.226819828 -0.3656193291  0.6272801850  2.452359e-01 -0.1055818877
## 3   1.023442273 -0.4168492104  0.5838532914  1.834367e-01  0.3205471692
## 4  -1.660614390  0.1893055789 -0.6832331135 -4.467309e-01  0.1391112588
## 5  -1.162625707 -0.0402780219 -1.1238816745  1.265443e-02 -0.5180914868
## 6   0.610903981 -0.4532336164  0.7011748627  3.158137e-01  0.3121636436
## 7  -1.923907729  0.0153494957  1.0342154305  1.749996e-01  0.5231652537
## 8  -1.440430099 -0.1551187605  0.6511412992  1.814852e-01 -0.1524974838
## 9   2.417591649 10.1557460525 -0.2487706327  2.437940e-01 -3.3086620956
## 10  1.284102071 -0.7646262522 -0.1207959400  4.678586e-01 -1.1861545264
## 11  0.193267512  0.2028925023 -2.0455358114 -3.627129e-01  1.1029000731
## 12 -2.149714988  0.2340675594 -0.7017321002 -2.415147e-01  0.0820620658
## 13  0.280504456  0.0439143289 -2.5708340073 -2.286556e-01  0.0172908584
## 14  1.029039261 -0.6381210775  0.3104083252  4.020970e-01 -0.4276546433
## 15 -2.013059289 -0.0777548973  0.6647966215  1.503282e-01 -0.2682199908
## 16 -2.470614841 -0.0397486257  0.5843177492  8.136221e-02 -0.6125758611
## 17  0.223680688 -0.5549209380  0.2356831075  3.337317e-01 -0.8387781072
## 18 -0.560907488  1.5153495482  0.6349469607  3.151614e-01  0.5183799035
## 19  2.633618499  1.8817839746  0.4689702061  3.352086e-01  0.9995804128
## 20 -3.017745746  0.4437972902 -0.4087892004 -2.644395e-01  0.5028522967
## 21  1.502702712 -0.5179181964  0.8047401541  1.452478e-01  0.7298229190
## 22  1.173302095 -0.6064052471  0.2835215136  1.519734e-01 -0.4993177730
## 23  0.172594142 -0.4847743706  0.2925243560  3.148966e-01 -0.5908483731
## 24  2.757031956 -0.4540209824  0.9556804346 -2.005668e+00  0.3770456867
## 25 -0.795123204 -0.2719401271  0.7106221350  4.182778e-01  0.0932717968
## 26 -1.829174001  0.2134687643 -0.7611858232 -1.720790e-01  0.1395987271
## 27 -2.161343236  0.2325716938 -0.7225821859 -1.490055e-01  0.0931803765
## 28  0.036810430 -0.1864050869 -1.1040859925  1.079865e-01 -0.2092750430
## 29  0.257715080 -0.4680138421  0.3259351204  2.415394e-01 -0.4119634623
## 30 -0.725176072 -0.2655379647  0.7195627649  3.344192e-01  0.1245921552
## 31 -2.931273329  0.6862573359 -1.9478990869 -4.559911e-01  0.5715134547
## 32 -0.979168864 -0.2075497069  0.6895955374 -1.551399e-01 -0.2234567010
## 33  1.014162773 -0.3381980517 -1.0644032320  5.209514e-02 -0.0134253070
## 34  0.334211907 -0.6900036158 -0.2151925323  5.527156e-01 -1.6648080158
## 35  3.513188599  1.0866531274 -1.3807852530  3.370012e-01  0.6205383544
## 36  0.425316008 -0.4298248785  0.7032450052  3.238203e-01  0.2779220180
## 37 -2.046000541 -0.0737638080  0.6649321765  1.535317e-01 -0.2739764617
## 38 -2.917194342  0.1712227818  1.0072326025 -2.483473e-01  0.0778893071
## 39  0.030920188 -0.0445921556 -0.6759132536 -1.977536e-01  0.5760625433
## 40 -0.902937604 -0.1014014890  1.1211863646  1.337103e-01  0.8900015555
## 41 -0.644846985 -0.1233295836 -1.1795942886  5.854913e-02 -0.5918163056
## 42 -1.925289093  0.2327182065 -0.7290456401 -3.201676e-01  0.0985745473
```

```
## 43    4.544935023 -1.1869847747  0.1092689177  1.614285e-01 -0.3408178968
## 44   -0.483771902  0.4584175407 -1.9242795894 -2.282477e+00  0.3336380205
## 45    3.523778051  0.9558472849 -1.8529542602  3.080978e-01 -0.3980367836
## 46    2.480808837 -0.7914705724  0.3940313817  3.187671e-01  0.0804143347
## 47   -1.726795559 -0.1117766897  0.6645543225  1.152982e-01 -0.2194920094
## 48   -1.833273100 -0.1196645725  0.6010926995  3.466528e-01 -0.3110692671
## 49    0.103554420  0.2186135922 -2.0264802932 -4.914853e-01  1.0294468778
## 50    2.625012866 -0.7386619920  0.3690001237 -6.101588e-02 -0.0201728317
## 51    1.783557379 -0.7022913203  0.4035534384  3.354392e-01 -0.0506482415
## 52    1.743439277 -0.6923042904  0.2356180587  3.143228e-01 -0.4000580757
## 53    0.004276196  2.8799410766 -2.0091973834  6.357616e-03  1.9872032052
## 54   -1.031179652 -0.1838619742  0.6046593202  9.433793e-02 -0.1748780075
## 55    6.318117489 10.6086945023  1.9782095172  2.289521e+00 -3.4393759556
## 56   -0.822330038  0.0372406300 -0.8229113827 -4.154839e-03  0.1552912585
## 57    0.304400174 -0.4152872775  0.7035836894  3.368002e-01  0.2570121825
## 58   -0.742874997  0.0429909607 -0.8286911330 -3.957081e-02  0.1941267844
## 59    0.208734140 -0.2432314162 -1.0971089095  1.887133e-01 -0.2207185209
## 60    0.673754156 -0.5776284238  0.3247356496  3.316383e-01 -0.4756826568
## 61    4.455959691  1.6962648759  0.5377310346  5.696725e-01  1.7565266059
## 62   -2.290254810 -0.1925816246  0.1991227993  1.554657e-01 -1.4003095173
## 63    0.181349944 -0.3627332636  0.7455351534  2.409305e-02  0.2099669723
## 64   -2.658971016  0.1424388710  0.9705382399 -1.611604e-01  0.1355048173
## 65    0.680557297 -0.5596618869 -1.9131657635  1.334085e-01 -1.9124241770
## 66   -0.803995527  0.1481490890 -2.5348529597 -7.692743e-02 -0.1500391827
## 67   -0.805371347 -0.2490130075  0.6600063095  4.988464e-02 -0.1530777991
## 68   -1.498003919  0.1842437185 -0.7471273434 -3.228121e-01  0.1761028782
## 69   -0.048235983 -0.3331379891  0.6530964592  3.259810e-01  0.1659341806
## 70    1.662874894  1.2619504692 -1.4974389287  3.130355e-01 -0.1448577241
## 71    3.048443902 -0.8237882619  0.5009775405  1.701191e-01  0.4067058487
## 72   -0.519768533  0.1646334595 -2.6032418578 -2.049821e-01 -0.1813681305
## 73   -0.847615762 -0.2746527827  0.6403020226  2.190289e-01 -0.1966850393
## 74    2.980011566 -0.6602980774  0.8023241720  1.555054e-01  1.1327402869
## 75   -1.047603612 -0.2169582512  0.6081034782  2.034112e-01 -0.2185346331
## 76    0.766151587 -0.5869306065  0.3388546987  2.173380e-01 -0.5115105015
## 77    2.194229183 -0.7802140257  0.3161316699  2.140695e-01 -0.2704962017
## 78    3.515891856  0.2813968452 -0.8531798369 -5.406305e-02  1.2055308774
## 79   -0.447035331 -0.3054137304  0.5497130763  3.504734e-01 -0.1538755854
## 80   -2.582554483  0.4081554253 -0.3287067408 -1.895444e-01  0.8439768025
## 81   -0.050449415 -0.0189718597 -0.6846836940 -2.067676e-01  0.5879034597
## 82    1.596941920 -0.7024353276  0.3957686498  4.315761e-01 -0.1351767376
## 83    4.285690226 -0.9695938217  0.5830244180  1.388034e-01  0.8169259345
## 84    0.105140372  1.4461007730  0.7648612326  2.196484e-01  0.8848036686
## 85   -1.252119308  0.3713894006 -2.1184795684 -3.684131e-01  0.6129969365
## 86   -1.460573300  0.5371694861 -0.1916080086 -4.985382e+00 -0.9505544150
## 87   -0.090738660  0.2682527167 -2.1378144808 -2.681849e-01  0.9675100680
## 88    0.350429503 -0.0975491250 -0.7031211915 -1.387329e-01  0.5763458329
## 89    0.544486779 -0.4456441504  0.7008008390  3.272480e-01  0.3014542091
## 90    1.702140530  1.6923145501 -2.4057853850  3.997677e-03  1.3347254341
## 91    0.642965349 -0.1564167872 -0.6701782938 -6.681861e-02  0.7295357630
## 92   -4.534100248  0.1706112149  2.5926100606  5.156107e-02 -0.2452692356
## 93    3.983407825 -0.9164731554  0.4739368616  4.222262e-01  0.7481095103
## 94    0.480474139 -0.1257043809 -0.5843889115  4.736608e-02  0.9298317757
## 95    0.291079485 -0.2289018835 -1.1168467456  1.505717e-01 -0.1870799707
## 96    5.584450687 -1.3959534594 -0.3174468846  6.011523e-01 -0.6152103820
```

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```
## 97    1.150505679 -0.4918778342 -1.5655942283  2.915760e-02 -1.1162332748
## 98    0.759827211  1.6347191192 -0.7785132131 -1.504848e-01  0.9906163078
## 99   -0.190502429 -0.0337484261 -0.6478836117 -1.368885e-01  0.5896324579
## 100  -1.133938480  0.0835779435 -0.7210676051 -2.115578e-01  0.2167999441
## 101   1.081435699 -0.4817094684  0.7973099581  2.627737e-01  0.6370198535
## 102   3.538162662 -0.5452836232  1.0124511406 -3.805800e+00 -0.3148580101
## 103  -1.736528514 -0.0067436552  1.0343064860  1.501512e-01  0.5547151299
## 104   7.227195849 10.9922611073  1.3572720659  1.452481e+00 -1.2607340064
## 105   0.175360339 -0.0770772606 -0.6361551314 -2.680578e-01  0.6033456957
## 106  -0.573742024  1.8077214354 -0.7439819137 -2.041259e-02  0.9015066896
## 107   1.608076095 -0.6564856781 -1.8372778277  1.770938e-01 -1.4822608581
## 108   0.566442530 -0.3717876927  0.4610835196 -1.903778e+00 -1.2649242740
## 109   3.721244016 -0.8933459696  0.5151278896 -2.534784e-02  0.5008345089
## 110  -2.997115091  0.4826755195 -0.4027187614 -4.872196e-01  0.4916153375
## 111   0.055350630 -0.5376270116  0.2319886354  3.838210e-01 -0.8621148739
## 112  -0.972396665  0.0612983528 -0.7255633992 -1.978219e-01  0.2503376008
## 113   0.175385479 -0.5320176119  0.2481880904  2.377160e-01 -0.8323851207
## 114   2.583803884 -0.3342872329 -0.4122021336 -5.414034e-02  1.8038503148
## 115   2.072373019 -0.4329846937 -0.9637658764 -1.112865e-01  0.4045383325
## 116  -0.870396458 -0.0942873871  1.1248756828  9.503398e-02  0.9222747286
## 117  -1.639285578  0.1445925701 -0.7192882017 -1.601074e-01  0.1289065919
## 118  -1.721131143  0.3031739812 -0.4123721659 -1.122904e-01  0.9018665615
## 119   2.173030733 -0.4060310252 -0.9087859472 -5.468345e-01  0.3453741425
## 120   1.392592181  2.1328865436  0.7790299126  3.153480e-01  1.3533568122
## 121  -2.599525607  0.1314703375  1.0450473277  9.732015e-02  0.4419072094
## 122   0.407798409  0.4753573757  0.8093396883  5.227161e-01  0.8529139013
## 123   0.287312993 -0.4295762253  0.6228076158  2.133530e-01 -0.0124716797
## 124  -0.883957806 -0.2503613221  0.6449496283  1.757381e-01 -0.1455001388
## 125  -1.790138037 -0.2574376940  0.1910328149  1.531926e-01 -1.3045564031
## 126  -2.439360321 -0.0449785446  0.5821470904  9.401795e-02 -0.6042846900
## 127  -1.435225432 -0.1479133417  0.6976719301 -1.584406e-01 -0.3117427021
## 128   0.141825522 -0.4987866756  0.2034851776  1.878357e-01 -0.9002027580
## 129  -1.528150267  0.1378863289 -0.7948912724  1.463347e-02  0.1296817615
## 130  -0.676991909 -0.2691305525  0.6039164831  1.766453e-01 -0.1859175823
## 131  -2.510892723  0.3950228616 -0.3352984279 -1.481161e-01  0.8652245023
## 132  -2.334930260  0.0781372187  0.9965869025 -2.293111e-01  0.1273022783
## 133  -0.543761996  1.5621184532  0.7416147961  2.846906e-01  0.8621389312
## 134  -1.376278033  0.1029807546 -0.7762708048 -1.498382e-02  0.1266481845
## 135   0.748427592 -0.5791540511  0.3350711248  2.425763e-01 -0.4773801049
## 136  -2.374227004  2.1231134863 -0.3475170671 -1.371086e-01  1.2538637101
## 137   2.650157097  1.4484596333 -0.4725079111 -6.417782e-01  1.8160281852
## 138  -1.230954899  0.0854795682 -0.7227879385 -1.797058e-01  0.1708991442
## 139  -1.668886304  0.0294606741 -1.1099109771 -2.947979e-02 -0.6230315131
## 140  -1.112861266  0.2368530551 -2.5707706355 -1.711037e-01 -0.2128013112
## 141   1.271694902 -0.7815176766 -0.1630706404  5.992606e-01 -1.2740630044
## 142  -2.350151277  0.1008903202  1.0602906367  1.726502e-02  0.4787480957
## 143  -1.301429913 -0.1800067445  0.6270819100  1.706824e-01 -0.2360985497
## 144  -0.726313250  0.0644311099 -0.7027697041 -3.294487e-02  0.5200569980
## 145  -2.253116846  0.0369847752  0.9428836005  9.248121e-02  0.1639025535
## 146   0.517031344  0.0272883023 -0.3854379589 -1.498735e+00  0.7241135412
## 147  -1.870478786 -0.0857757506  0.6773036975  3.582375e-02 -0.2614468677
## 148  -2.224513617 -0.0492551773  0.5281039502  1.354893e-01 -0.5721123140
## 149  -0.839179759  2.6843518850 -0.6507882447  1.282265e-01  1.2362274088
## 150  -2.459303069 -0.0249864654  0.5581334432  7.919780e-02 -0.6204829968
```

```
## 151   3.201820898   1.0612625687  -1.4636930666   4.416842e-01   0.2773728534
## 152   1.189712920  -0.4697615376  -1.4557721010   1.558919e-01  -0.6977652417
## 153  -0.532435244   0.1373423005   1.2641689216  -4.622757e+00  -0.9759499606
## 154   0.325934152   0.0550406908  -2.5305012759  -5.119259e-02   0.2232470704
## 155  -0.544292523   0.0355638921  -0.7370829260   2.339253e-02   0.4898202449
## 156   0.052837653  -0.3745712066   0.6967203193   3.296481e-01   0.2029215410
## 157  -0.626883545  -0.3976035862   0.1734081247   4.192688e-01  -0.9444657037
## 158  -1.252338272  -0.1725010732   0.7127782584   3.326153e-01   0.0836194289
## 159  -1.119715730   0.0785099487  -0.7602040925  -9.687991e-02   0.1980816601
## 160   0.445275374  -0.5387461185   0.3415237672   2.320501e-01  -0.5375680957
## 161   1.442995690  -0.5621307677   0.7217785251   6.859715e-02   0.3286262461
## 162  -1.612567726  -0.1540244338   0.6475310868   2.436705e-01  -0.2403628242
## 163  -2.251783546   0.2965492874  -0.7457991423  -1.382650e+00  -0.6311703086
## 164  -1.658931374   0.1928809202  -0.7730240133  -1.491929e-01   0.1742436394
## 165  -1.226185935  -0.0549592167   1.1209933852   1.707258e-01   0.8675086117
## 166   0.522898742  -0.3655456141   0.7987028653  -4.285711e-01   0.1940358956
## 167  -0.367473300  -0.0248048522  -0.6530176960  -6.849425e-02   0.5349456254
## 168  -0.670756339  -0.1473926563  -1.1458594566   1.426916e-01  -0.5320259794
## 169  -0.153825398   3.3508149569  -1.3187432092  -4.900684e+00   1.2235205917
## 170  -2.154803368  -0.0597247336   0.6665921863   1.547949e-01  -0.2946694480
## 171   2.045202426  -0.5593016950   0.8946530481   1.307568e-01   1.0754666381
## 172  -1.979069873   0.0218103101   1.0341275860   1.827838e-01   0.5139619322
## 173   1.608425099  -0.7105224820   0.3049051475   3.697259e-01  -0.3220855463
## 174   2.094715613  -0.6317350891   0.6131482096  -5.691124e-01   0.0900565787
## 175  -2.130862988   0.2008858975   1.5105392447   1.157799e-01   1.5507506244
## 176  -0.622378153  -0.3008835958   0.6408728531   1.856139e-01  -0.1594000607
## 177  -1.271982253   0.0835317727  -0.7324085651  -1.004743e-01   0.1772938945
## 178   0.523570282  -0.5129626604   0.2651969686   2.892840e-01  -0.5371178397
## 179  -0.773625512  -0.0700490500  -1.2123493962   5.498658e-02  -0.5637042574
## 180  -0.061345329  -0.0480532380  -2.9109754853  -1.572728e-01  -0.7915215096
## 181   0.293675630  -0.0418877754  -0.6389748058  -5.177381e-02   0.8832770164
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## 184  -0.484443898  -0.3017650943   0.5751974588   2.690565e-01  -0.1704846752
## 185  -0.928382799   0.6509331289   0.6637563814   2.217187e-01   0.1489304918
## 186  -1.447016469   0.1029463591  -0.7510120276  -4.173612e-03   0.1576758671
## 187  -1.539907515   2.8017692970  -0.7441601734  -1.164847e-01   0.8320205968
## 188  -0.057178281  -0.3708158621   0.7060102389   3.647484e-01   0.1925259169
## 189  -1.266869013  -0.0228901804  -1.1167204334  -2.895246e-02  -0.5456361988
## 190  -0.020086947  -0.2466075088  -1.1537324084   1.316007e-01  -0.4748911597
## 191  -0.866459843  -0.2583038878   0.6484604865   1.526251e-01  -0.1792908709
## 192   1.659479532  -0.6900760786   0.4000770362   3.781494e-01  -0.0668064273
## 193   0.638532981   0.0012324298   1.3370237611  -4.581007e+00  -0.5323134781
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## 198   3.435323705  -0.8650841234   0.5427420810  -1.823630e-01   0.3185858618
## 199  -0.103613573  -0.1850026619  -1.2238666821   1.328861e-01  -0.4837613628
## 200   7.527255628   0.4543947876   0.7886476438  -1.141414e+00   1.6158141355
## 201  -1.314543054  -0.1794083351   0.6614787978   9.806036e-02  -0.2093083503
## 202  -2.380955958  -0.0490580929   0.5861467913   5.574937e-02  -0.5999535444
## 203  -0.761675005   0.0668884812  -0.7016418630   2.029023e-02   0.5588891898
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## 205    0.641553077   1.2807884792   0.3062356079   3.791278e-01   0.1934202532
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## 208    0.348172423  -0.3999244270   0.7208237488   1.925256e-01   0.2724080507
## 209    1.956755326  -0.2188110830  -2.4753559365  -1.128879e-01   0.4533188023
## 210   -2.550828456   0.4032718075  -0.3303085089  -1.813219e-01   0.8515594263
## 211   -2.427434094   0.2591136773  -0.8390097935  -1.798444e-01  -0.2177328929
## 212   -3.003625616   0.4618237256  -0.4386190363  -7.834813e-01   0.1680528875
## 213   -0.042108412  -0.2893494800  -1.6028019437   1.269645e-01  -1.2111941096
## 214   -0.399594716  -0.1737162915  -1.1377360790   4.530923e-02  -0.4974424522
## 215    2.819110414  -0.8157227388   0.4858398803   3.221490e-01   0.3570281795
## 216   -1.541529875   0.3803018779  -2.1306492760  -2.253260e-01   0.5171668954
## 217   -0.535977033  -0.3324602886   0.5985485245   3.219741e-01  -0.2265849945
## 218   -2.086875757   0.2144552386  -0.7189684941  -1.171342e-01   0.1165676355
## 219   -1.181055777  -0.2055068124   0.6587069441   1.082880e-01  -0.2147860232
## 220    1.763763484  -0.6589498209   0.3754597872   1.561261e-01  -0.1391525387
## 221    2.908236327  -0.3454646137  -0.6305543004  -2.027452e+00   0.4307759418
## 222    2.526983330  -0.6552888557   0.7936292480   4.429985e-01   1.0386823363
## 223   -1.127961271  -0.1698940677   0.6825164187  -9.993346e-02  -0.1431486631
## 224    0.303324600   1.8614237247  -0.2819846953  -1.896494e-01   2.0805531274
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## 226   -2.352922944   0.1141342624   0.9243370866  -8.208120e-02   0.1972546211
## 227   -2.916966931   0.1432048247   0.9676265918   5.603514e-02   0.1328058136
## 228    3.713453465  -0.5374434640  -1.0035480818  -4.512877e-01   0.6463765678
## 229    0.098608581  -0.3879272171   0.7078643460   3.304206e-01   0.2162922925
## 230   -1.916211100  -0.1136211966   0.4974971400   2.397450e-01  -0.5982638108
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## 233    0.564518795  -0.1873063449  -1.0722566789  -3.896667e-01  -0.1731174184
## 234    0.370829879  -0.4134725674   0.7172662614   2.230749e-01   0.2492834145
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## 237    1.205545348  -0.6494100720   0.3239674788   2.751341e-01  -0.4166042332
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## 242    2.057407398  -0.9631248528  -0.5491094343   4.337849e-01  -1.9300888766
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## 251   -1.608249392  -0.1080973356   0.6196456830   1.566752e-01  -0.2030842642
## 252   -0.356378805  -0.4003373780   0.1910172289   1.509694e-01  -0.9455282233
## 253    1.277827126  -0.6920114104   0.2180837161   3.331470e-01  -0.6361912722
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## 255   -1.353033020  -0.1794925310   0.6549196240   1.534346e-01  -0.2067266072
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## 278   3.413954648 -0.8276003629  0.4725206593 -1.761654e-01  0.2565758485
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## 280  -0.149548109 -0.6222874289 -0.2191353006  6.103867e-01 -1.7158251611
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## 285  -1.472782525  0.1434681112 -0.7376482620 -1.392570e-01  0.2265041344
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## 341  -1.894636975  0.4765913344 -2.1007712594 -4.339673e-01  0.5436122833
## 342  -1.694617494  0.1618329654 -0.7902597877 -5.280846e-03  0.0938063096
## 343  -0.154796853  0.0936437473 -2.5888315325 -1.835414e-01 -0.1320069291
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## 346  -0.167698901  2.2389903343 -1.6933800938 -3.082027e+00  0.8706547114
## 347  -2.816988362  0.1414747097  0.9819067153 -6.660665e-02  0.1299204400
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## 350   0.768108460 -0.4279805933  0.8090871421  2.065080e-01  0.5996181976
## 351   0.682527885 -0.2754955348 -1.2561188300  8.939936e-02 -0.3828445808
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## 353  -2.407366594 -0.0402705553  0.5941617754 -2.450108e-03 -0.6155237609
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## 359   2.511891110 -0.7648987913  0.4827072023  3.735669e-01  0.3732022331
## 360   0.146882165 -0.6046828860 -0.0972114921  4.670574e-01 -1.3367722591
## 361   0.347261005 -0.4005938234  0.7197240890  2.010950e-01  0.2737776653
## 362  -2.375660567  0.1009448631  1.0560996646  5.276434e-02  0.4802428148
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9

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## 369    0.108279733 -0.2458446210  1.1096435146   1.043605e-01  1.0131712184
## 370    1.005843553 -0.4808585928  0.7858660258   3.604737e-01  0.6400978732
## 371    0.378936813 -0.6879368301 -0.2475240577   5.765379e-01 -1.6957018412
## 372   -0.500834097 -0.3226008493  0.6423019116   1.650926e-01 -0.1727174901
## 373    0.543597441 -0.6018060488  0.2228705680   3.909794e-01 -0.7669438394
## 374   -1.867296293 -0.0898806090  0.5583694227  -2.776236e-02 -0.5273182908
## 375   -3.011777775  0.4505242157 -0.4486360793  -1.666749e-01  0.5116555034
## 376    2.215509204 -0.7309174154  0.4930208602   3.386189e-01  0.2769248468
## 377   -0.138100901 -0.4576115741  0.2773743442   4.153829e-02 -0.8620515938
## 378   -0.540133705  0.1372581188 -2.5179359803  -2.470831e-01 -0.0969899983
## 379   -3.196916355  0.1818641952  0.9754873339   3.169608e-02  0.0745891418
## 380    7.424729725  0.2572342808  0.1374121242   2.852857e-01  0.9159943870
## 381   -2.165591177 -0.0787820644  0.5801230749   7.429242e-02 -0.5552001457
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## 383   -0.263654661 -0.1470302276 -1.0890529412  -3.525151e-01 -0.5100333289
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## 386   -1.259073572  0.0950166855 -0.7258196126  -1.589070e-01  0.2022305114
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## 388    4.281047637 -0.6813368831 -0.8558262351  -9.395522e-02  1.1031979995
## 389   -1.470426951  0.1068928097 -0.7325570706  -7.375822e-02  0.1439530253
## 390   -0.100846399 -0.2957880997  0.6881186078   6.899513e-02  0.1430322246
## 391   -3.681210465  0.9904818970 -1.3897215293  -1.435317e+00  1.2032267456
## 392   -0.670006893 -0.3879182984  0.2869898537   3.618310e-02 -0.9652923718
## 393   -1.488622355 -0.2096642332  0.5554857327   2.009162e-01 -0.5341588993
## 394   -1.696499475  0.5807845469 -1.8171107857  -3.004812e-01  1.3165516766
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## 397    0.446205538  1.7077285078 -0.7004819557   8.141674e-02  1.3513399335
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## 406   -3.082914798  0.1716433578  0.9800997836  -1.844719e-02  0.0874698462
## 407    4.268195467 -0.8420765069  0.9832920712  -5.988534e-02  1.5475387152
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## 416    0.150005960 -0.3971530848  0.7034098625   3.580339e-01  0.2311530356
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## 418   -1.014518290  0.0565428069 -0.7275184549  -1.712404e-01  0.2140418760
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## 427   2.005809915  2.2394488479 -0.9616684050  3.490287e-01  1.3546200582
## 428  -0.940487755  2.7095197825 -0.6720686692  9.747066e-02  1.1679689494
## 429  -1.129956261  0.0271162726  1.2414056564 -7.732908e-01  0.7488169415
## 430  -0.856616382 -0.3592476452  0.2608699569  2.426106e-01 -0.8649943384
## 431   0.057965946 -0.4216876893  0.6572119136  5.706006e-01  0.1112376829
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## 434  -2.379529285 -0.0480102644  0.5878681255  4.233533e-02 -0.6020974479
## 435   0.575616417 -0.6104826242  0.2395939487  2.705700e-01 -0.8484711702
## 436  -1.292652643 -0.2661172634  0.3196885160 -1.532744e-01 -1.0202042641
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## 442  -1.453717289  0.2802530307 -2.5039279606 -2.553896e-01 -0.1751865469
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## 474  -0.034100803 -0.3406932578  0.5850437101  1.349839e-01 -0.0747968947
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## 498   -0.879360895 -0.2788362961  0.6129126994  3.243556e-01 -0.2223279785
## 499    3.505312484 -0.9150213350  0.4719721771  3.464281e-01  0.4603601250
## 500   -0.563303188  0.1338399878 -2.5897436261 -3.768691e-02 -0.1468417127
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## 503   -1.019926852 -0.0381354059 -1.1516745238 -1.030019e-01 -0.5929874858
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## 505    1.295651822 -0.5256801872  0.7945785756  2.684128e-01  0.6132490560
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## 507   -0.582644707  0.1870179612  1.2470835811 -4.768067e+00 -0.9921035421
## 508   -2.256407160  0.0851862831  1.0537552010  5.541506e-02  0.5036508275
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## 510   -0.691723086 -0.2192553066  0.6605415396  2.471108e-01  0.0895319358
## 511   -2.144397976  0.0507040327  1.0473485465  1.024743e-01  0.4676946268
## 512   -1.846769781  0.4671186536 -2.1341454663 -2.990274e-01  0.5716043646
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## 525    3.210674442 -0.8364319085  0.5797517898  2.963734e-01  0.6716155207
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## 535   -1.065630003  0.3496683339 -2.1664859500 -3.513064e-01  0.5363587844
## 536   -0.401787949  0.1234732056 -0.3457327021 -7.872710e-04  1.3220151237
## 537    0.810529601 -0.0399916685 -2.4495830453 -1.816374e-01  0.3194932146
## 538   -0.208215763 -0.2871526108  0.7089534893  3.233049e-02  0.1210387620
## 539    0.694314910  0.0640584606 -2.4526775166 -7.253162e-01  0.1379014803
## 540   -0.190158078  0.3775366894 -1.7497032753 -2.074403e-01  1.7698819717
## 541   -0.956458798  0.0222858162 -0.8239750028 -1.838522e-01 -0.0210117519
## 542   -2.014123476 -0.0691415015  0.6768061051  5.816052e-02 -0.2850402219
## 543    2.749063911 -0.9135853000  0.1128851006  3.221930e-01 -0.4262279584
## 544    2.105547030 -0.0819230078 -0.5348511302  5.374171e-01 -1.6058051597
## 545    0.994411000  1.3196419446  0.6952670043  3.066941e-01  0.9223628694
## 546    0.465519952 -0.0914674300 -0.7528333538 -4.880638e-02  0.6346606922
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## 548    1.675923597 -0.6873936334  0.4066239451  3.257106e-01 -0.0730979870
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## 550    0.147280820 -0.5244742591  0.2541591735  1.954443e-01 -0.8454096801
## 551    0.045833137 -0.3797134767  0.7106561440  3.157643e-01  0.2035024068
## 552    0.905854651 -0.5176690882  0.6520774440  4.546301e-01  0.2511484988
## 553    0.595577875 -0.5806795386  0.3191597110  3.906964e-01 -0.5130562489
## 554    0.024469999  0.0706695325  1.4621310770 -3.352804e+00  0.1958464032
## 555   -2.034665736  0.0795193524  1.0478631709 -7.213235e-02  0.5163709167
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## 590   -1.683671804   0.1424467785  -0.8110928844  -2.075236e-01  -0.0661427173
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## 592    0.776380395  -0.5509067842   0.2186927233   3.840365e-01  -0.5490331460
## 593   -1.621064589   0.1395225125  -0.7843394747   4.360118e-02   0.1217458218
## 594   -0.188738191   0.1217817204  -2.5144151731  -3.384454e-02   0.1642781630
## 595    1.380977928  -0.1079715272  -2.4383034693   8.834946e-02   0.6067687951
## 596    1.076107492  -0.3251484759  -1.1050341781  -5.798885e-02  -0.1410941269
## 597    0.663933428  -0.0369242042  -2.4579493266  -9.231504e-02   0.2744196879
## 598   -0.967290016  -0.2149273600   0.6370058776   2.284927e-02  -0.2331505742
## 599    0.306848103  -0.5460087526   0.1543465446   4.180145e-01  -0.8995994092
## 600   -1.707038791  -0.1066612118   0.6750981282   3.171236e-02  -0.2307616618
## 601    4.870976154  -1.0023508421   0.7159452267  -1.995076e-01   1.0464426673
## 602   -2.062881738  -0.0673723126   0.6711513172   1.079069e-01  -0.2854474280
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## 604   -1.587377936  -0.1735894541   0.6393112505   2.812331e-01  -0.2963862208
## 605   -3.594553725   0.2075077583   0.8875411777   1.240160e-02  -0.2492910283
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## 610   -1.908180536   0.1859840788  -0.7293549971  -6.033302e-02   0.1611672002
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## 614    8.284849409  -1.1181488887   0.9992859034  -4.178291e+00   0.4458900218
## 615    1.429489802  -0.3411236404  -1.0694301219   2.128009e-01   0.2786693631
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## 623   -2.869026629   0.4214949893  -0.4154625885  -2.323140e-01   0.5372395775
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## 630    5.276092144  11.0960995321   3.1735649529   1.525885e+00  -1.2670752070
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## 649  -3.584778666   0.3701958252   1.3761923986  -1.348762e-01   0.8057541903
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## 651   3.415350748  -0.5537619502  -0.7827370273  -1.766360e-01   1.1058853917
## 652  -3.115989931   0.3310448365   1.4569310582  -6.935458e-02   1.1516490445
## 653  -3.428923896   0.1882306335   0.8879777244  -1.229931e-02  -0.2218965499
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## 657  -1.571415920  -0.0059486506  -1.2764597575   5.408689e-02  -0.9540103234
## 658  -0.994940918   0.2192832018  -2.5892613648  -1.419193e-01  -0.2228392129
## 659   0.452622567  -0.2106685525   1.2392649404  -2.081721e-01   1.3659490816
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## 670   1.691166357  -0.7269166963   0.3073736676   3.462159e-01  -0.3434027802
## 671   1.145917477  -0.2407032972   1.1831669437  -1.976991e+00   0.5555639147
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## 679  -1.823393385  -0.1549034182   0.5321889025   2.384710e-01  -0.6006199974
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## 681  -0.704448070  -0.2463060487   0.7266001697   2.654055e-01   0.1821133172
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## 683  -0.232399874  -0.3520069679   0.7033062997   4.081126e-01   0.1666516696
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## 717  -1.976489340  0.0442347541  1.1239877806  2.382801e-01  0.7684065254
## 718  -2.054352814  0.0785632712  1.0222314966  4.085592e-02  0.5288008097
## 719  -2.246636068  0.0958827643  1.0397472638  3.487504e-02  0.4957346516
## 720  -1.886518244  0.6426919970  0.2120894029  2.405091e-01 -1.0101716878
## 721   0.553021983  1.4616975919  0.9203462668 -9.624623e-01  0.6280779953
## 722  -1.232194366 -0.2168849200  0.6458725874  2.196498e-01 -0.2375316936
## 723   0.617307802  0.0024663485 -2.4805940115 -1.607365e-01  0.2744778827
## 724   1.025943076 -0.7959038077 -0.1701845887  4.865780e-01 -1.4927363982
## 725   0.844639519 -0.6943086371 -0.2608804613  4.504153e-01 -1.5038616795
## 726  -0.411141299 -0.5567431071 -0.1938053155  4.371605e-01 -1.7313759614
## 727  -2.209210623  0.2373456170 -0.7070484605 -1.929857e-01  0.0793708054
## 728   0.933203502 -0.0434008772  1.3113517889 -4.427795e+00 -0.4150449274
## 729  -1.238541430 -0.2007525125  0.6558157002  1.379186e-01 -0.2204977403
## 730  -1.923968031  0.1931788499 -0.7218162647 -1.162411e-01  0.1480526963
## 731  -0.254196175  0.2265772573 -2.1327689030 -3.749402e-01  0.7377247709
## 732  -1.548398339 -0.1538698267  0.6584865025  1.511973e-01 -0.2446949478
## 733  -0.388866257 -0.3323113047  0.6354747581  1.970097e-01 -0.1124457930
## 734  -0.758524901 -0.1386988895 -1.1364219086  8.759224e-02 -0.5918238028
## 735  -2.371645259 -0.0516147902  0.5840870296  7.038077e-02 -0.5955255867
## 736  -1.125871024  0.1284855767 -0.8120932748 -1.134376e-01  0.2405062547
## 737   0.721857153 -0.4451642020  0.7888560081  3.740916e-01  0.5879476813
## 738   0.607724528 -0.4385179662  0.6637659039 -1.427455e-01 -0.0150585943
## 739  -0.175064519 -0.3517072053  0.6853438179  4.233778e-01  0.1748898463
## 740   2.207421496 -0.5683460695 -1.5216544256  4.711621e-02 -0.6114805883
## 741  -0.376683076 -0.3054166958  0.5502881026  2.908250e-01 -0.1533166646
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## 743   0.596690541 -0.4719397358  0.6488954048  4.096521e-01  0.1450668965
## 744   1.289232484  1.8450961979  1.3712818577 -5.704277e+00 -0.1835821363
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## 745    0.545354363  -0.7172022599  -0.2359068325   5.696655e-01  -1.6599574036
## 746    2.523166421  -0.9420504435  -0.0805861202   3.453367e-01  -0.9533790066
## 747    0.390732862   0.5268336137   0.6649347402   2.420483e-01   0.5240767894
## 748   -2.039253012  -0.0893372031   0.5863266334   1.032999e-02  -0.5424386044
## 749    0.513268257  -0.2739132006  -1.0572516240   6.168087e-02  -0.1080096834
## 750    0.427400777   0.2356652815  -2.1160468474  -5.372441e-01   1.0502374985
## 751    3.013991033  -0.6709478948   0.7010617930  -2.085276e+00  -0.3824098566
## 752   -4.017664195   0.6901953167  -0.0978510243  -4.148052e-01   0.9082970423
## 753   -0.018507969  -0.1861593992  -1.2428110110   9.477255e-02  -0.5158409944
## 754    2.605074944  -0.9499261594   0.0033167445   4.486505e-01  -0.7410378817
## 755   -0.862770457  -0.2330609830   0.7306727048   2.606344e-01   0.1178222837
## 756    2.563867224  -0.8261569679   0.3011499965   2.754550e-01  -0.1553670281
## 757    0.686143687   1.2972464441   0.7680574749   4.732596e-01   0.9593348638
## 758   -0.889247975   0.0660840990  -0.8365246662   1.606436e-02   0.2081695188
## 759    1.539687765   1.8111201662  -0.1686492028   7.274678e-01  -0.5776257497
## 760   -0.154326271  -0.4225653229   0.5809378993   5.127211e-01  -0.1803602331
## 761    1.066272890  -0.5898916683   0.2637977356   2.134991e-01  -0.5137903078
## 762    1.719446926  -0.7229317994   0.3059224428   3.475989e-01  -0.3047271151
## 763   -1.187007028  -0.1984786915   0.6558341561   1.250088e-01  -0.1799274547
## 764    1.506846778   1.4234846074  -0.9968220249   3.083009e-01   0.9475150520
## 765   -0.914484065   0.3724756846  -2.0748693715  -3.407089e-01   0.8772525493
## 766    0.229934861  -0.3856931745   0.7577512562   4.980374e-01   0.4738550793
## 767   -0.696447272   0.0622918178  -0.6994006103  -5.691845e-02   0.5217547136
## 768    0.423621437   0.0351881689  -2.5254589574  -3.329420e-02   0.2485800823
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## 772    0.013219934  -0.0740272956  -0.6589684866  -7.181847e-02   0.6075463884
## 773    1.088901040  -0.5757183425   0.3129601148   2.242716e-02  -0.4682159441
## 774   -1.775061545   0.0318856408   0.9901843845   1.134023e-01   0.5224047235
## 775    1.089293488  -1.0124519897   1.2828538724   5.828411e-01  -1.6850089937
## 776   -0.608168588  -0.1824099382   1.0653964868   3.932315e-01   0.8540345947
## 777    0.879486439  -0.3149769421  -1.0540801720  -9.891417e-03  -0.0504956695
## 778   -2.564292710  -0.4503365884   3.7565578191   4.000473e-01  -0.6317608685
## 779   -0.725217441  -0.0462364094  -1.1425763107  -3.721226e-01  -0.6258554804
## 780   -1.093373933   0.0814150345  -0.7572820621  -1.458145e-01   0.1932173108
## 781    2.469854275  -0.7562395057   0.4107018947   4.433697e-01   0.2211036456
## 782    0.373155468  -0.4211595186   0.7067787069   3.033825e-01   0.2642080989
## 783   -1.766848881   0.1987656322  -0.7505770962  -1.750959e-01   0.1551924872
## 784   -1.464394603   0.1361254622  -0.7256494367  -1.460070e-01   0.2310538109
## 785    4.163942658  11.0578787167   2.6529395066   2.048732e+00  -2.4004027617
## 786   -0.528624079   0.0422751961  -0.7164313282  -1.689179e-02   0.5579167809
## 787    1.250247227   2.3977660726  -0.6508156009   3.423603e-01   1.7082005270
## 788    2.045649684  -0.5157414619   0.9104860905  -7.313613e-01   0.6432013241
## 789    1.324167359  -0.7892128953  -0.0649417370   3.796155e-01  -1.1777439998
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## 791   -1.325987546   0.1292432329  -0.7753240501  -1.275486e-01   0.1778487388
## 792    6.573909138  -2.0190312766  -1.3467430219   1.057091e+00  -3.0483319062
## 793   -0.289603616  -0.2375779958   0.6628655012   1.016997e-01   0.2035687546
## 794    0.313375821  -0.4086950618   0.7144131391   2.524084e-01   0.2435242173
## 795   -0.391244223  -0.3668754899   0.3003117590  -4.476380e-01  -1.0820585731
## 796   -2.007153299  -0.0734172087   0.6719224170   9.479825e-02  -0.2770950938
## 797   -1.312115391   1.7663604197   1.1921039053   1.595811e-01   1.5456169474
## 798   -2.122154750   0.2261243538  -0.7083600467  -1.941242e-01   0.0959047416
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## 800   -1.242187624  -0.0798499696   1.0372193824   7.630717e-02   0.5704780971
## 801    2.822894672   2.7445139204   0.5254739924   2.806015e-01   1.3313365045
## 802    1.432354611  -0.6480855987   0.2273190541   3.832224e-01  -0.4158488360
## 803   -1.221956565   0.0618994072  -0.7428256607  -2.072912e-02   0.1683004664
## 804   -0.511093607   0.0317642832  -0.7145205671  -6.197608e-02   0.4852444920
## 805    1.226852042  -0.6619462293   0.3097943999   3.813225e-01  -0.3933641746
## 806   -1.176804354  -0.2003802728   0.6548505948   1.312536e-01  -0.1768398932
## 807   -0.879776587   0.0632938580  -0.6377224951  -1.322827e-01   0.4909170270
## 808    0.795847746  -0.6288662187   0.2267875922   3.283643e-01  -0.7297289081
## 809    0.101898848  -0.2948086921  -1.6277717379   8.717985e-02  -1.2341877301
## 810   -0.799145264  -0.3688574105   0.2224034142   2.607241e-01  -0.9634896043
## 811    0.288847976  -0.6570728658  -0.2138201832   4.780585e-01  -1.6237815727
## 812   -0.825743407  -0.2093952481   0.7115961997   1.601335e-01   0.0951936299
## 813   -1.379071467   0.3906236927  -2.0429848638  -1.796837e-01   0.8335650464
## 814    2.316635919   1.1342359267   0.8679140575   2.421259e-01   1.4751233490
## 815    0.252995504  -0.4060667649   0.7080293757   3.092555e-01   0.2421623963
## 816   -2.615771476   0.1312838854   1.0588531907   6.254514e-02   0.4358373113
## 817    0.796414531  -0.4673042254   0.7123047688   2.063615e-01   0.3281022020
## 818    1.345349316  -0.5972431562   0.2728796712   3.812995e-02  -0.4618015697
## 819   -2.664809616   0.4023734628  -0.4083495710  -3.133032e-01   0.5619062206
## 820   -0.489595437  -0.1348152188  -1.1381825052  -2.115669e-02  -0.4640759704
## 821    1.206737937  -0.7300935464  -0.1276173705   3.113447e-01  -1.2730340057
## 822   -0.706719853  -0.2056522782  -1.5506678762   8.240411e-02  -1.2674735227
## 823   -0.110706840  -0.3289580977   0.7208162232   2.394688e-01   0.2586141134
## 824   -2.399468542   0.1022489459   1.0539613908   7.226737e-02   0.4791809199
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## 826    1.280365244  -0.7022851409   0.1379392000   5.059252e-01  -0.7589396635
## 827    0.160575981  -0.3893898717   0.7161629837   2.586512e-01   0.2152691579
## 828    0.945143576  -0.6451079535   0.2287861074   2.937632e-01  -0.7072599189
## 829   -2.226017879   0.0793208839   1.0505405985   7.620605e-02   0.5132422195
## 830    1.346267832  -0.1451978343  -0.5484507744  -1.099181e+00   0.7116460046
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## 832    1.472488602  -0.4541754163   0.9371637456  -8.441600e-01   0.4136929225
## 833   -2.329033415  -0.2519993588   2.0807383337  -5.319047e-01  -1.1101192346
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## 836    2.145705183  -0.1751871858   1.3854520371  -4.407096e+00   0.0657711380
## 837   -0.606784424  -0.5268215442  -0.1335587959   3.787319e-01  -1.6281895674
## 838   -1.566521739  -0.1161975785   0.6851155745  -6.339091e-02  -0.2208877312
## 839    1.674652393  -0.7547175269   0.3702586467   6.360103e-01  -0.1823455532
## 840   -1.373458729  -0.1871033744   0.6525545638   1.803712e-01  -0.2387865834
## 841    0.119878713  -0.5684966072  -0.1239049229   4.156853e-01  -1.3304213435
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## 843   -2.094210501   0.2184631872  -0.7145246699  -1.503442e-01   0.1091703532
## 844   -0.802975478   0.2798697175  -2.1255399705  -3.475247e-01   0.5711702739
## 845    0.766669415   1.1165054217  -0.0212337862   3.170821e-01  -0.6483460449
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## 848    1.541006902  -0.6942732087   0.3166168506   2.883983e-01  -0.3497101720
## 849   -0.913582413  -0.2553333555   0.6447792214   1.869922e-01  -0.1821560787
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## 867   -0.608226920 -0.0912560312 -1.1992932850 -3.205608e-03 -0.5393458566
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## 888    0.884834411 -0.5643698448  0.2311497403  3.720531e-01 -0.4923668497
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## 903    6.038839362  0.2978255646 -0.4007396347  7.200530e-01 -0.2316665284
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## 909   0.979967874  -0.1818574155  -0.7688433403   7.177572e-02   0.7250978452
## 910  -2.096271809   0.3359267666  -0.3910233323  -7.223405e-02   0.8444320359
## 911   0.451243541  -0.5850809590   0.2310833516   3.397581e-01  -0.7939356901
## 912  -0.815388222  -0.2592293078   0.6930398342   4.233110e-01   0.0839135667
## 913   1.307073461   1.9689270724   0.4119489354   6.076274e-01   0.5693387481
## 914  -1.386273570  -0.3120068166   2.4458551626   1.684431e-01   0.1781619341
## 915  -0.981795717  -0.2490630466   0.6422381348   2.153140e-01  -0.1901664594
## 916  -0.920261322  -0.2142027587   0.6186894704   8.796899e-02  -0.1824258670
## 917  -1.776669179   0.1359011619  -0.8122717087  -1.742252e-01  -0.1439985027
## 918   0.630408821  -0.5257565712   0.2208319722   3.918205e-01  -0.5421550749
## 919   3.904984168  -0.8711368818   0.5772956021  -5.268484e-01   0.4457558339
## 920   1.843874926  -0.3773306418  -0.9114282831  -4.779789e-01   0.2615082172
## 921   1.970559214  -0.6119217152   0.5627107381  -9.119435e-01  -0.2395642460
## 922  -1.023105399  -0.3401595650   0.2465219346   1.907660e-01  -1.0150108959
## 923  -2.083500177   0.2121788115   1.2623738604  -1.570311e+00   0.2438184912
## 924  -1.729247810  -0.0354881663   0.7091339816  -4.866867e-01  -0.3409479481
## 925  -1.175289387  -0.3166357404   0.2495174521   2.100801e-01  -1.0064180088
## 926  -0.632168346  -0.3043160623   0.6343780086   2.367950e-01  -0.1520558191
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## 928  -0.193502531  -0.0197608158  -0.6937168345  -9.546564e-02   0.5483043349
## 929   0.282381612  -0.4331981061   0.6168577231   2.597194e-01  -0.0050611514
## 930  -0.142070983  -0.3128428188  -1.5142691884   3.064045e-02  -1.2203654331
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## 935   0.134343922   0.1463810032  -2.4306669518  -1.464966e-01   0.5082594913
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## 2992 -0.310150115 -0.1789815411 -1.2156988810  1.951765e-01 -0.5408028573
## 2993 -0.855441285  0.0290240247 -0.7959393974  1.748974e-02  0.1968916748
## 2994  2.065439505 -0.5652325013  0.9014687506  8.188967e-02  1.0375597574
## 2995 -2.598835503  0.2500840115 -0.8119141802 -8.326901e-02 -0.2197111347
## 2996 -3.589401174  0.2112920792  0.8937579211 -3.604432e-02 -0.2570339165
## 2997 -1.039647277  0.0636727236 -0.7867575313 -2.392837e-02  0.1875480558
## 2998 -1.300456164 -0.1675528604  0.5945027817  2.132306e-01 -0.2382097957
## 2999 -1.194912652 -0.1125079020  0.9735282462  3.271176e-01  0.5137718644
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## 3002  0.613396323 -0.2564105827 -1.1214269028  6.345244e-02 -0.1446868868
## 3003 -1.575304195 -0.5682117257  1.5721255703  4.230212e-01 -1.6618025327
## 3004  2.546835152  2.3648205015 -2.3665594730 -9.467467e-03  1.5248931940
## 3005 -1.138989974  0.1221352491 -0.7680834765 -2.650016e-01  0.1862562106
## 3006  1.057096552 -0.6297544389  0.2358668579  5.104982e-01 -0.4914016451
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## 3008  7.147260317 -1.4558603060  0.3032780743 -1.598601e-01  0.5235495028
## 3009  3.895522774 11.3773109660  1.0864173886  1.796244e+00 -2.4261963592
## 3010  2.811379483 -0.7505425072  0.7536597950  3.998274e-01  0.8624083464
## 3011  2.980376551  1.0780565698  0.8605069404  4.760217e-01  1.7990658802
## 3012 -0.077889262 -0.3877663300  0.6208619180  2.753732e-01 -0.0715123575
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## 3023  2.119840774  2.9639667356 -1.4352608260  4.574451e-01  0.5733620291
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## 3051  1.602027771  1.7615246496 -0.4575328269  7.170248e-01 -0.9647420921
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## 3077  -0.771199918  -0.1769406363   0.7677027197  -7.822737e-01  -0.2965252711
## 3078   0.041412927  -0.1098160723  -0.8012717022  -1.564823e-02   0.2655077034
## 3079  -0.650237682  -0.2894022089   0.6524570792   1.001680e-01  -0.1801607490
## 3080   0.340581524  -0.5541144066   0.1597135557   4.185783e-01  -0.8907961592
## 3081  -1.810100201   0.4858232275  -2.1714935195  -3.052091e-01   0.5636951101
## 3082  -0.133776053   0.2448690290  -2.1305364609  -1.223884e-01   0.9949334431
## 3083  -1.997365058   0.3058193453  -0.3401305234  -1.587784e-01   0.8630783259
## 3084   0.784155345  -0.2588503795  -1.0142573232  -3.159368e-01  -0.0580215320
## 3085   1.575640096  -0.6876266474   0.3318161504   1.671131e-01  -0.3649156469
## 3086   0.025653140   1.7000972410  -0.5927816843   8.681672e-02   1.3088325844
## 3087   1.209630417   1.1462710912   0.3225887840   4.701639e-01   0.1998461955
## 3088   0.980534781  -0.5854473020   0.4227009638   2.856347e-01  -0.1810441577
## 3089   2.270964528  -0.6167958400   0.6898002656  -5.571963e-01   0.2300352633
## 3090   0.230174496  -0.5595465164   0.2302246638   3.748484e-01  -0.8301171271
## 3091  -1.152460731  -0.2723813332   0.2139684198   1.449804e-01  -0.9632945135
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## 3094  -0.532943223  -0.1029025370  -1.2003782752   6.971930e-03  -0.5224816478
## 3095   5.044814172   2.8879958339  -2.5351715956   3.120836e-01   2.2436712260
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## 3099  -0.885494141  -0.2472813825   0.6307237748   1.244211e-01  -0.2293312446
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## 3103  -1.188659843  -0.2060556269   0.6069239651   2.595069e-01  -0.2341597847
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## 3105   0.200985688   0.0541940057  -2.4699249643  -7.439230e-02   0.2820620313
## 3106  -0.215544112  -0.5508368554  -0.2121086529   3.503169e-01  -1.6858486860
## 3107  -0.072147332  -0.2954557709  -1.5956230824   7.637145e-02  -1.2926216150
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## 3110   4.307963005  -1.0247476910   0.4746550394   2.346186e-01   0.5285608900
## 3111   0.110283902  -0.4182502167   0.6688009243   5.090504e-01   0.1451283379
## 3112  -0.312274988  -0.3420882507   0.7039763118   4.132568e-01   0.1522205896
## 3113   5.898107343  -1.1290937814   0.6966454827  -1.896682e-01   1.2787027227
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## 3119  -3.219243087   0.4649162956  -0.4126208331  -2.090215e-01   0.4740987235
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## 3131  -2.207495430  0.0929248037   1.0728886180  -9.794788e-02  0.4854079973
## 3132  -1.366788242  0.1462474207  -0.8028583423  -9.531021e-02  0.1669541015
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## 3134  -1.881652518  0.2160301113  -0.7523522920  -1.755077e-01  0.1316591355
## 3135  -0.551714140 -0.3223900152   0.6340871157   2.347887e-01 -0.1699362332
## 3136   0.863830433 -0.3398786949  -1.0682914897   1.136073e-01 -0.0972192525
## 3137  -1.867724796  0.0096384053   1.0355348940   1.576176e-01  0.5308346067
## 3138  -1.244294858 -0.0588644259   1.1124377644   2.388181e-01  0.8763020008
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## 3154   5.690219111 -0.9323732782   0.8828375851  -3.824012e-01  1.6858070818
## 3155  -0.109153154 -0.3731483006   0.6363147333   1.606320e-01 -0.0982088604
## 3156  -0.096897239 -0.3099153434   0.6757849594   1.921339e-01  0.1673750771
## 3157   0.782653711 -0.6282221604   0.2254913121   3.400279e-01 -0.7301632058
## 3158  -1.537364711  1.2386267445  -2.1844385811  -2.183314e-01  0.5774451553
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## 3162   0.235332338 -0.3186171013  -1.5374365290   2.610039e-01 -0.9598704958
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## 3165   1.521581396 -0.6145904464   0.4261138987  -5.506924e-01 -0.5047130503
## 3166  -1.725756377  0.1149203423  -0.8216184687  -1.028209e-01 -0.1543250225
## 3167   0.609953443 -0.4578226667   0.2343591568  -4.166842e-01 -0.8340510925
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## 3892  1.026469780 -0.3237722215  -1.0182892146  -2.916703e-01  -0.1390085500
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## 4317 -0.773378680 -0.2747597234  0.7102707790  4.181760e-01  0.0974344993
## 4318  5.251910198  0.4563864781  0.1184765582  6.746225e-01  0.5249452955
## 4319  3.239727435 -1.0287116209 -0.0019724944  4.075125e-01 -0.6264225124
## 4320  3.454347978 -0.9354016914  0.3769087882  3.371590e-01  0.2049458706
## 4321 -1.440638138 -0.1912078789  0.5778076865  1.703922e-02 -0.5250924770
## 4322 -0.259633219 -0.3504001692  0.7010232304  4.291700e-01  0.1652113522
## 4323  0.954492558 -0.6271073764  0.3135192224  3.877939e-01 -0.4445670561
##        train_pc.PC6  train_pc.PC7 train.price
## 1     -0.0391540821  0.3825642969      257500
## 2     -0.1053274700  0.5576904275      323000
## 3     -0.3378903109  0.1269348717      662500
## 4     -0.2357669607 -0.7892787640      310000
## 5      0.1024614784 -1.1091551492      485000
## 6     -0.3882096315  0.1360064588      580500
## 7     -0.2449815141  0.0356643988      280000
## 8      0.0681197771 -0.9574377111      685000
## 9     -5.6252408373  0.1691894194     1350000
## 10     0.4512438246 -0.5120492019      920000
## 11    -1.1208814577 -0.7293639766      505000
## 12    -0.1117559792 -0.5339586574      204000
## 13    -0.5291943129 -0.4074701127      571000
## 14    -0.0055389669 -0.0884495866      360000
## 15     0.2294604228 -0.6226444134      480000
## 16     0.4063635773 -0.4207089185      315000
## 17     0.2681972920  0.3142520679      243500
## 18     1.8830883053  0.0019006725      329950
## 19     2.4086191740 -0.4740920568      480000
## 20    -0.3275310325 -0.1294779946      205425
## 21    -0.6998625370 -0.6557649546      770000
## 22     0.0684908481  0.3278980881     1450000
## 23     0.2628799873  0.1178849456      660500
## 24    -0.6430200058  0.9433158451      784000
## 25    -0.0307646485  0.5636734090      519950
## 26    -0.1496316852 -0.6535331992      205000
## 27    -0.1029157476 -0.5245284301      420000
## 28    -0.0821795873  0.1915878488      500000
## 29     0.0671445378 -1.8237794734      890000
## 30    -0.0733154419  0.1636341733      532170
## 31    -0.5540357143  0.9243580353      269950
## 32     0.0438604392 -0.0671271856      284000
## 33    -0.4112221080 -0.4463463882      673000
## 34     0.8168634408  0.7015497709      399950
## 35     1.4497800283 -0.1464869150     1095000
## 36    -0.3369967759  0.2421196850      465000
## 37     0.2384444785 -0.6040452064      470000
## 38     0.0461003682 -0.1476571238      280000
```

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## 39   -0.5860445195   0.1808409628      325000
## 40   -0.5161251481   0.2644037441      479950
## 41    0.1513498720   0.5141290917      264950
## 42   -0.1279329323  -0.5971350575      235000
## 43   -0.3885583091   0.3086231926     1025000
## 44   -0.6909747507   0.2868531945      416000
## 45    1.9476100382  -0.9257663641      472000
## 46   -0.4502845448  -0.8443863506      455000
## 47    0.1518157686  -0.7833234978      236000
## 48    0.2981596039   0.4220307037      331000
## 49   -1.0601727370  -0.2898101653      450000
## 50   -0.3500121785  -0.3859680809      770000
## 51   -0.2570806578  -0.4439483927      370000
## 52   -0.0496901837   0.3778170708      580000
## 53    1.8393698702   0.1611922369      550000
## 54    0.0802288588  -0.3536366512      404000
## 55   -3.2714406114   1.9553158426     3075000
## 56   -0.2374452902   1.0132966902      576000
## 57   -0.3040921150   0.3102294869      208633
## 58   -0.2753459346   0.6150607672      315000
## 59   -0.1018863441   0.7919704803      550000
## 60    0.0695470254  -0.2447011544      610750
## 61    1.9629410624  -0.1916184395     1384000
## 62    0.8559833207  -0.5062474442      268750
## 63   -0.2792721520   0.0518838741      520000
## 64   -0.0050922359  -0.2734333503      240500
## 65    0.6746226543  -1.0204930113      279000
## 66   -0.2824486885   0.1364899542      791500
## 67   -0.0167451744  -0.1945850085      245000
## 68   -0.2328984874  -0.8248535280      315000
## 69   -0.1339672265   0.6111663763      604950
## 70    1.9456230086  -0.0337893711      795000
## 71   -0.6448973457  -1.0811304966      810000
## 72   -0.2259734437   0.4944777922      315000
## 73    0.0410744057   0.5489150790      297000
## 74   -0.9796329476  -0.2008778312      950000
## 75    0.1149953793   0.3567451217      252350
## 76    0.0786738017   0.0877768641      403950
## 77   -0.2908153036  -0.3657327687      927000
## 78   -0.2187669349  -1.2393499985     1118000
## 79    0.0330419853   0.7830068718      378750
## 80   -0.4985581776  -0.3192823548      352000
## 81   -0.5779473319  -0.1242776284     1300000
## 82   -0.1547070096   0.3925698503      328500
## 83   -0.9768709376  -0.9786020673      988000
## 84    1.6190316456  -0.3509889495      578000
## 85   -0.7006752156  -0.3360765317      227950
## 86    0.0800759366   0.3650666762      350000
## 87   -0.8848507339   0.3067903140      520000
## 88   -0.6029900770   0.7561393466      691100
## 89   -0.3703917577   0.1728492457      496500
## 90    0.9980805299  -0.0183751711      578000
## 91   -0.8050240368  -0.2446832259      348000
## 92    0.4395861773   0.2464923456       80000
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## 93    -0.7852306470 -0.3412823765     1150000
## 94    -0.7838653244  0.2761925992      328500
## 95    -0.1228446468  0.4160820698      295000
## 96    -0.2089120662 -0.8669183675     1067000
## 97     0.1705771255 -0.1395324121      669950
## 98     1.2960943629  0.8001773452      299000
## 99    -0.5967794654 -0.1248504089      342000
## 100   -0.3403301289 -0.3830387324      280000
## 101   -0.5614667926 -0.0572986151      750000
## 102   -0.4605234124  0.2736990874      890000
## 103   -0.2956910737 -0.0692574769      200000
## 104   -4.9334804953 -2.3367252985     2125000
## 105   -0.6628134658  0.0519391290      375000
## 106    1.5077394806  0.0166275502      705000
## 107    0.3683313783 -1.4904768267      750000
## 108    0.4378900128  1.2555711319      460000
## 109   -0.8206517946 -1.4438198392      863000
## 110   -0.3212392441 -0.4465721501      405000
## 111    0.3120993692  0.4048379215      338900
## 112   -0.3861395406 -0.4781394326      264000
## 113    0.2593023475 -0.0158992308      439000
## 114   -1.4543620359 -0.7821949934      900000
## 115   -0.7415914095 -0.9644354760     1220000
## 116   -0.5509463699 -0.1200057701      507000
## 117   -0.2026442643 -0.0980157737      200000
## 118   -0.5830036448  0.3873464059      605000
## 119   -0.7437085948 -0.9650021812      480000
## 120    2.2826641593  0.1267010437      650000
## 121   -0.0972009481 -0.2904390160      542000
## 122    0.5682924864  0.4376426184      729500
## 123   -0.2466246769  0.2650080459      430000
## 124   -0.0023465718 -0.1658359691      545000
## 125    0.7168278592 -0.7947490816      425000
## 126    0.3969055903 -0.4404299671      495000
## 127    0.1710760850  0.1966676490      269900
## 128    0.3644643439  0.4679568850      496500
## 129   -0.1520740756  0.2713532990      460000
## 130    0.0442027081  0.5207300209      497000
## 131   -0.5209823763 -0.3661397853      280000
## 132   -0.0610836106  0.2550461212      188000
## 133    1.7404044397 -1.0584541076      478500
## 134   -0.1849128904  0.5309035459      222000
## 135    0.0540489567 -0.2760527370      980000
## 136    1.3768142864 -0.2697111302      325000
## 137    0.5810246106 -0.5876489015      530000
## 138   -0.2871453978  0.0395051415      243000
## 139    0.2459705925 -0.8112369682      215000
## 140   -0.1540925279  0.0437220799      250000
## 141    0.5653033371  0.6360055998      350000
## 142   -0.1729984534 -0.4388061610      245000
## 143    0.1456952654  0.1182419165      328000
## 144   -0.4207068002 -0.1177273911      605000
## 145   -0.0610760484  0.5546801606      459000
## 146   -0.7581639843 -0.2820510019      740000
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## 147    0.1965630970  -0.6898478768      305000
## 148    0.3901315173  -0.4952736737      395000
## 149    2.4107443644  -0.2034359649      517500
## 150    0.4357355526  -0.3833775598      329999
## 151    1.6058382711   0.6546774899      942500
## 152   -0.0462079857  -1.6452193393      405600
## 153    0.2133464471   0.6360469827      330000
## 154   -0.4990763982   0.4129778158      760000
## 155   -0.3871679149   0.5535069691      420000
## 156   -0.2187936877   0.4763654427      269950
## 157    0.5225549416   0.1584950868      493000
## 158    0.0350814842  -0.2495096879      320000
## 159   -0.2925133284   0.0054094293      522000
## 160    0.1391081898  -0.0996005741      308000
## 161   -0.5210716711   0.8003579697      379000
## 162    0.1684814306  -0.1247930798      310000
## 163    0.0753010579  -0.4670160014      325000
## 164   -0.1910046353  -0.7449070282      431000
## 165   -0.4563572687   0.0754486151      419950
## 166   -0.3474629408  -0.0855280153      330000
## 167   -0.5235005842   0.3390354438      352000
## 168    0.0699675970   0.0725374609      664000
## 169    1.9983761580  -0.6690889250      425000
## 170    0.2686726847  -0.5413818574      565000
## 171   -0.8954578516  -0.8957237817      860000
## 172   -0.2300811581   0.0664901130      466000
## 173   -0.1649811558  -0.4187490521      395000
## 174   -0.3352797920  -0.4326883070      800000
## 175   -0.7278890620   0.2134673024      200000
## 176   -0.0196695777   0.4232632632      314950
## 177   -0.2804333443   0.0527262982      234000
## 178    0.1971940956  -0.0403207605      615000
## 179    0.1729589460  -0.0964647935      384000
## 180   -0.0363642599  -0.9948011503      290000
## 181   -0.6679242439   0.1422272749      800000
## 182    0.0933454974   0.6445586129      299900
## 183    1.8284598049  -0.5631065172     1200000
## 184    0.0307205174   0.7917124878      253000
## 185    0.9778562113   0.0114617515      335000
## 186   -0.2263074838   0.1560173806      532500
## 187    2.6859011551  -0.1438358788      397500
## 188   -0.2050496581   0.5153364228      524250
## 189    0.1339708017  -1.0434592717      399000
## 190   -0.0544756449   0.4397202048      291000
## 191    0.0222147637   0.1978432989      270000
## 192   -0.2250644474  -0.3779416395      325000
## 193   -0.1325748528   0.3964637304      540000
## 194    0.2155557415   0.2859537619      375000
## 195   -0.3379760097  -0.6393737154      543115
## 196    0.5330948676   0.2386455185      900000
## 197    1.6572332749   1.0671053452     2450000
## 198   -0.6474966480  -0.1457713888     1050000
## 199    0.0276521628   0.2340918629      620000
## 200    0.2559897172  -0.2087363810      935000
```

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## 201    0.0941413206  -0.2776499865      275000
## 202    0.3829162204  -0.4690992885      325000
## 203   -0.4522660886  -0.4887674520      490000
## 204   -1.0838324490  -0.1975601019      500000
## 205    2.0048345987  -0.9320137776      575000
## 206   -0.3084326836   0.8189233609      453500
## 207   -0.7477475647  -0.6663556923     1127000
## 208   -0.3357576643  -0.0667102437      285167
## 209   -0.9542885666   0.4720430936      660000
## 210   -0.5078836824  -0.3386898050      690000
## 211    0.0526373219  -0.3921289526      353000
## 212   -0.2552151629  -0.1404407288      195000
## 213    0.4355862392  -0.8781983762      369000
## 214    0.0002394519  -0.0711804276      620000
## 215   -0.5620114290  -0.5980597585      687500
## 216   -0.5724652559   0.5535979934      252500
## 217    0.0637985570   1.5098688409      460000
## 218   -0.1366590982  -0.5866839336      194000
## 219    0.0844137606   0.0146428615      850000
## 220   -0.1480507263   0.0490635021      749950
## 221   -0.8776731665  -0.7517568941      925000
## 222   -0.8385096618   0.7318249666      875000
## 223   -0.0021618691  -1.1006878391      423000
## 224    0.7714031617  -0.0276141097      545000
## 225    0.5113293080  -1.0554829064      220000
## 226   -0.0570904203  -0.4095694894      173000
## 227    0.0279245033  -0.1880142379      406000
## 228   -0.8601453751   0.6913129713      630000
## 229   -0.2463961536   0.4299109041      254000
## 230    0.3998238678   0.4487573859      510000
## 231   -0.1010508434  -0.5121744620      179950
## 232    0.2639098615  -0.5716158440      470000
## 233   -0.1989096461  -0.3795119709      500000
## 234   -0.3158265551   0.2868978037      455000
## 235    0.0856428005   0.0184410943      307000
## 236    0.3767279460  -0.0852634659      211000
## 237   -0.0471437747  -0.1735975800      350000
## 238   -0.3467556995  -0.0838187298      438000
## 239   -0.5795929477   0.4927825640      317000
## 240   -0.0426752622   1.1634507587      265000
## 241    0.1935614163   0.3241680005      295700
## 242    0.8294493790  -0.4752852811      484000
## 243   -0.3126590588   0.6767488969      363000
## 244   -0.0498318065   0.6721635254      403000
## 245    0.0312889619   0.2166558821      371025
## 246   -0.3564682900  -0.1253905973      350000
## 247   -0.1475032340   0.5483556618      748000
## 248   -0.0926166022   0.9854085597      285000
## 249    0.0730277662  -0.9458200233      360000
## 250   -0.4695561769   0.3604134200      428000
## 251    0.1626132501  -0.7949948554      533000
## 252    0.4789143895   0.0589103696      225000
## 253   -0.0253649966  -0.2944077953      530000
## 254   -3.9279519932   0.9049989861     5300000
```

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## 255    0.1015663198  -0.2627412180      455000
## 256    0.3039450028   0.5961244001      620000
## 257   -0.5564030815   1.8054137528      625000
## 258   -0.0535025013  -0.6478134361     1200000
## 259    0.6167391004  -0.1622868181      567000
## 260   -0.5247388381   0.3690616387      605000
## 261    0.5162166312   0.0904125515      805000
## 262   -0.7308208601  -0.0903725019      700000
## 263   -0.0424660530  -0.3333001182      260000
## 264    0.0288049904  -0.4523129982      320000
## 265   -1.0331042967  -0.6304434330      260000
## 266   -0.1843455354  -0.2940016718      503000
## 267   -0.0740801450  -0.4874397832      433500
## 268   -0.1589012459  -0.7263280734      250000
## 269    0.0941279932  -0.1936274171      283500
## 270    0.6843525786  -0.2374274700      245000
## 271    2.8031277706   1.3472090195      585444
## 272    0.1603810310  -0.7648266398      389000
## 273    1.5002448571  -0.4738848354      780000
## 274   -0.6764030787  -0.3438173144      914600
## 275   -0.6083667033   0.4386967138      715000
## 276    0.2660942764   0.3933511327      535000
## 277    0.8792882523  -1.0300003105      352950
## 278   -0.5268541568   0.3535155935     1229000
## 279   -0.3671721545  -0.2117557040      215000
## 280    0.9247350017   0.6087808140      515000
## 281   -0.3206001206   0.5159021181      672500
## 282    1.8485969539  -0.9396837225      707500
## 283    1.9913791189   0.0686144422     1328000
## 284    0.5861673257   0.1856876592      519500
## 285   -0.2924946940  -0.9197041541      650000
## 286   -0.1424307216  -0.2062530152      640000
## 287   -0.0465100130   0.6791375581      455800
## 288   -0.0132493957  -0.2721422283      250000
## 289    0.8303722007   0.7235712608      229950
## 290   -0.4699464151   0.4224884559      532000
## 291   -0.0894044940  -0.2620761312      423000
## 292    0.2525538616  -0.5742028262      425000
## 293    3.3140497251  -0.2190870668      612000
## 294   -0.1230167561   0.2419707475      355000
## 295    0.2635849836   0.1224582174      610000
## 296   -0.1471317640  -0.3015238543      550000
## 297   -0.1684954268  -0.0323299155      337000
## 298    0.1182999877   0.7375896620      405000
## 299   -0.3411043830  -0.4491426078      775000
## 300   -0.4216194924  -0.7854231390      810000
## 301   -1.2970588231   0.0933713616     1250000
## 302    0.0789812827   0.0876157258      420000
## 303   -0.1378240099  -0.2971485630      350000
## 304    0.9611426656  -0.1451474463      860000
## 305    0.1723587793   0.2475549154      607010
## 306   -1.0963680684   0.2488566382      797000
## 307    0.4227906177  -0.6664744092      776500
## 308    0.2250915697  -0.6312079625      235000
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## 309    0.0582853364 -0.9771608864     440000
## 310   -0.3366403532 -0.6232758142     380000
## 311   -0.5723616779 -0.9245440988     650000
## 312    1.6173425325  0.1114620810     800000
## 313   -0.1896846292 -0.6157359258     703770
## 314   -0.1588317495  0.9868556631     667500
## 315    0.4613917759  0.6710001961     378000
## 316   -0.0394906696  0.0695600473     290000
## 317   -0.4925666047 -0.2219345776     549500
## 318    0.0813349251 -0.0766991584     245000
## 319   -0.4722263842 -0.8035713555     520000
## 320    0.1492511467 -0.1640902034     177500
## 321   -0.2108861607  0.8419922538     495000
## 322   -0.2416310620  0.1285383376     325000
## 323   -0.2267278483  0.1440019749     411000
## 324   -0.1269092366  0.3440367124     450000
## 325   -0.0356901503  0.7011933233     238000
## 326   -0.3264905364 -0.1314950940     255000
## 327    0.1687777069 -0.0837084112     400000
## 328    1.5600093066  2.1453123965     490000
## 329   -0.7864562255 -0.7410923213     720500
## 330   -0.0175576873 -0.2723360551     220000
## 331    0.2372458154 -0.6059935828     293000
## 332    0.0791674343 -0.5318786088     224000
## 333   -0.1994679231 -0.4049270186     275000
## 334   -0.2576863028  0.0714973635     510000
## 335   -0.3026927169 -0.1581028943     374000
## 336    0.1729512608  0.3449515749     196440
## 337   -0.3137457965 -0.5594118009     749000
## 338    0.1108154633 -0.2668197306     365000
## 339   -0.2876373046  0.9357099884     453000
## 340   -0.4326737338  0.0440902368     338000
## 341   -0.5739415333 -0.6978375803     345000
## 342   -0.1035996696  0.3713598569     337000
## 343   -0.3286064694  0.6142615043     544500
## 344    0.0697829449 -0.4897014116     445000
## 345   -0.1797805329 -0.5958478689     541100
## 346    1.1060434053  0.3859880512     397000
## 347    0.0073767320 -0.2295410065     300000
## 348   -0.6398983954  0.9991408669     416000
## 349    0.7110879957  0.7577814500     480000
## 350   -0.4989113229 -0.2396552466     600000
## 351   -0.1291858123  0.1989281103     467500
## 352   -0.0177787517 -0.1129774698     305000
## 353    0.3937352234 -0.4461565825     300000
## 354    0.1263342391  0.4131900802     269000
## 355   -0.3584387405 -0.4214586998     341000
## 356   -0.1058061828  0.4742811023     215500
## 357   -0.6247635554 -0.1884597228     780000
## 358   -0.7094944115  0.8261693345     480000
## 359   -0.5356243623 -1.1689037892    1315000
## 360    0.7045027411 -0.6066529736     607000
## 361   -0.3360137511 -0.0673164261     360000
## 362   -0.1680061143 -0.4287667598     469000
```

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## 363  -0.3933720856   0.4638823196      824500
## 364  -0.2338594956   0.4884742859      762500
## 365   1.7240458655  -0.0980758090     1569500
## 366   0.3492330467   0.1703062151      353500
## 367   0.1422972295  -0.7994415670      315000
## 368   0.3141405518   0.4096695994      339000
## 369  -0.7399003956   0.4257941619      740000
## 370  -0.5462268595  -0.0265580644      618000
## 371   0.8671445247   1.0918613519      345000
## 372  -0.0242410091   0.7265166034      425000
## 373   0.1756886522   0.1219443857      349000
## 374   0.2818443748  -0.7048825296      340000
## 375  -0.3016915406  -0.1010218349      315000
## 376  -0.4229380871  -0.6224045081      685000
## 377   0.3021682772  -0.5504031162      640000
## 378  -0.3738727284  -0.3641244252      460000
## 379   0.1073433269  -0.0231355217      265000
## 380   0.8788679756   0.5916559522      740000
## 381   0.3218301758  -0.5959163869      230000
## 382  -0.6724701399   0.0061479504      315000
## 383  -0.0420086651  -0.4678362716      378000
## 384   2.8874434585   0.3212653560      598800
## 385   2.0195365288   0.7563041624     1249000
## 386  -0.3086109792  -0.3177351508      335000
## 387  -0.5873727130  -0.2705367113      840000
## 388  -1.2162814162   0.2109241489     2400000
## 389  -0.2267530009   0.1637913325      347000
## 390  -0.1339327156   0.3022899266      550000
## 391  -0.9345654105   0.2665673731      420850
## 392   0.4506314880  -0.2425360573      302000
## 393   0.2379861762   0.4793380833      252000
## 394  -0.9701533018   0.3709208030      725000
## 395  -0.0983361923  -0.2842977155      439000
## 396  -0.3234947508  -0.1217016744      420000
## 397   1.2009369248  -0.4758178533      635000
## 398  -0.1737648638  -0.2716231196      562500
## 399  -1.2026310494   1.7349413306     1600000
## 400  -0.2245552639  -0.5419872496      399950
## 401   0.0346145732  -0.3962960218      180000
## 402  -0.0335096565   0.7063547644      280000
## 403  -0.7893850976  -0.0684544202      463500
## 404  -0.0326038121  -0.1445139278      352000
## 405  -0.8250647908  -0.1539881090      507000
## 406   0.0785758398  -0.0823412063      329350
## 407  -1.4083188993  -0.2291900401     1480000
## 408  -0.3368187112  -0.0701108208      719950
## 409  -1.2192514821  -0.0012475348      235000
## 410  -0.6029019866   0.5528990594      440000
## 411  -0.1748886697  -0.6656203656      219950
## 412  -0.5674868755   0.1579381239      575000
## 413   0.0531861220   0.0336678756      349000
## 414   0.3509307224  -0.7627422520      319990
## 415  -0.1247317973  -0.3387779000      510000
## 416  -0.2623543189   0.3965812524      550000
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## 417    0.3211506921  -0.5975247909    150000
## 418   -0.3479302844  -0.0865990864    361000
## 419   -0.7433967218  -1.2858408830    884250
## 420   -0.0216186204  -0.5125149250    225000
## 421   -0.5038235682  -0.0226851238    419000
## 422   -0.7839675208  -0.8924163293    750000
## 423   -0.0142437678   0.0950041071    491000
## 424   -0.0790272584  -0.6306272441    280000
## 425   -0.6238050892   0.3886644444    399950
## 426    0.0922196632  -0.0544898270    250000
## 427    2.1751365039  -0.4949936872   1735000
## 428    2.5030946584   0.2759277811    280950
## 429   -0.4550437696  -0.2260934255    525000
## 430    0.4061433225  -1.2742431968    440000
## 431   -0.1084392927   1.9431540553    570000
## 432   -0.1821224573  -0.6800765179    250000
## 433    0.4785697529  -0.2780379147    265000
## 434    0.3833170816  -0.4681504109    234000
## 435    0.2300547921   0.8608257470    499000
## 436    0.5511440387  -0.9701273212    275000
## 437    0.0891174224  -0.0300375724    265000
## 438   -0.1232122925   0.3434457374    399000
## 439   -0.1196199020  -0.3238202097    347000
## 440   -1.2936233931  -0.5300586519   1680000
## 441   -0.4106630501  -0.7630440765    760000
## 442   -0.2031087559  -0.9476481293    398000
## 443   -0.2893193163  -0.5113706777    398000
## 444   -0.2476572549  -0.1928539860    875000
## 445    0.9353866953  -0.9147425327   1339000
## 446   -0.4194320097   0.0817278696    390000
## 447   -0.2317598527  -0.1589344236    235000
## 448   -0.3004163544   1.2318000253    429500
## 449    0.0763474899   0.2576210201    569000
## 450   -0.2327939373  -0.1604932267    225000
## 451    0.0195166151  -0.0362523912    342000
## 452    0.7397263068  -1.2039648285    302000
## 453   -0.5535349862  -0.7994109202    898000
## 454   -0.4064072234   0.9084620335    583000
## 455    0.1120940647  -0.8657919527    552500
## 456    0.3385326962  -0.1650076309    270000
## 457    1.7814816434   0.1526533595    283000
## 458    0.1576997439   0.4365563144    510000
## 459    0.1016317613   0.1394888380    230000
## 460   -0.6455243347   0.3653784719    554000
## 461    0.0675021980  -0.2764348092    618000
## 462   -0.3999784257  -0.3219316716    500000
## 463   -0.3807203722  -0.2393807751    254000
## 464   -0.2523883701   0.6959658950    172040
## 465   -0.3484698858   0.8669701690    365000
## 466   -0.1960694733  -0.0851195308    193000
## 467   -0.1572403142   0.2222113505    449950
## 468    0.5435367462  -0.0901138585    335000
## 469    0.0498777249  -0.3655005105    325000
## 470    0.1317132296  -0.9029160258    335000
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## 471   0.0869051189 -0.7493076238      808900
## 472  -0.0480747095  0.6763227450      335000
## 473  -0.1880399467 -0.6931948154      305500
## 474  -0.1157143003  0.1773972735      355000
## 475  -1.2364968572  1.2176191589      985000
## 476   0.0069516859 -0.4546649623      143000
## 477   2.3555190793  0.3988014710     1126000
## 478   0.9451334561  0.0979537472     1600000
## 479  -0.7218442613  0.6266738806      409900
## 480   0.0624805348 -0.8000111858      739900
## 481   0.1286084487  0.1899754705      500000
## 482  -0.6658236720 -0.6645444431      549000
## 483   1.1974287346 -0.3272862307     1865000
## 484   0.6520428927 -0.9848718631      236500
## 485  -0.3965807292 -0.1875358128      340500
## 486  -0.4706932023  0.3577219701      335000
## 487  -0.7998129986  0.0785258596      353000
## 488   0.0836594712  0.4167893721      640000
## 489   0.5390830787  0.1264045521      322000
## 490   0.9165394996  0.2474767512      300000
## 491   1.5180383232 -0.4379887992      753888
## 492   0.5318462694  0.2063611086      342000
## 493  -0.9765421017  0.2219562608      685000
## 494   0.2430028237 -0.5932551596      166000
## 495   0.0726441542 -0.9476170459      415000
## 496  -0.3899320824  0.4463592033      535000
## 497   0.3194113422  0.2204709109      627000
## 498   0.0902185206  0.9489581490      340000
## 499  -0.7265152640 -0.6267996553      865000
## 500  -0.2663779343  0.4402354387      595000
## 501   0.4844363497  0.7296566829      235000
## 502  -0.4405688200  0.0276242388      276000
## 503   0.1775485273 -0.3650921333      265000
## 504  -0.4715261343  0.7557061639      890000
## 505  -0.5653461704  0.5597115002      612000
## 506   0.0507269324 -0.2181474255     1600000
## 507   0.2523436105  0.3732791191      439950
## 508  -0.2013778776 -0.4979822385      695000
## 509  -0.7815604541 -1.3557317104      965000
## 510   0.0086373899  0.2716460918      385000
## 511  -0.1792556826  0.1725753487      134000
## 512  -0.5767923641 -0.7184110221      415000
## 513  -0.2209269504 -0.1359939934      352500
## 514  -0.1266987208 -0.3425448236      320000
## 515  -0.8459889530 -0.2453066252      381500
## 516  -0.5086416947 -0.3554742352      343000
## 517  -0.6918441111 -0.0901304655      205500
## 518  -0.0625267629 -0.2064547073      561000
## 519  -0.6317973768  0.4308974265      399950
## 520   0.6690615729  0.1518865538      279900
## 521  -0.3234988482 -0.1217113733      290300
## 522  -0.3744876479  0.5374363370      590000
## 523   0.0397103871 -0.8505448479      415000
## 524  -0.2200032305 -0.1337722818      246500
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## 525  -0.7148971834  -0.7493665600     1272000
## 526   0.0731416476  -0.3211354264      305000
## 527  -0.8696863480   1.1029865108      925000
## 528  -0.3856983601   0.0031780885      895000
## 529  -0.2764834099  -0.4783199109      645000
## 530  -0.3376834830   0.2407608750      259000
## 531  -0.5589038520   1.4754836395      872000
## 532   2.0762804211  -0.3208924545     1000000
## 533   0.1567587697   0.2542915135      350000
## 534  -0.0485665010  -0.1654086275      523000
## 535  -0.6139231213   0.7408630608      456150
## 536  -0.9229093419   0.7880960602      820000
## 537  -0.7151332342   0.0308509286      687000
## 538  -0.1194319752   0.3454814924      285750
## 539  -0.5279495537   0.6675380809      610000
## 540  -1.3628935290   0.6636344795      780000
## 541  -0.3179877880  -0.1898629377      273000
## 542   0.2352413325  -0.6098494132      223000
## 543  -0.0943612679  -1.2706674135      749999
## 544   1.7748875827  -0.3665301913      779000
## 545   1.5357963534   0.6840926876      570000
## 546  -0.6249551490   0.3655829691     1150000
## 547  -0.2109043530  -0.3488681966      388000
## 548  -0.2265239776  -0.3805075138      405000
## 549  -0.5998975416   0.1225492838      555000
## 550   0.2696453705   0.0059167841      420000
## 551  -0.2308251916   0.4623240080      416000
## 552  -0.3302850119   1.4788111363      560000
## 553   0.1158655448   0.1633676796      638500
## 554  -0.5215929072   0.1182132543      750000
## 555  -0.2324083357  -0.5780482042      430000
## 556   0.1312118333   0.1952489594      310000
## 557  -0.5002467232   0.0689467574      503000
## 558   0.2438855847   0.0948184870      157500
## 559   0.0476976870   0.8141424411      248000
## 560   0.0633656707  -0.3371291329      245000
## 561  -0.2422647014   0.2735505807      459950
## 562   1.7391847743   0.2474110800      425000
## 563  -0.6970589852  -0.0211225668      250250
## 564   0.4029975405   0.4334516018      162000
## 565  -0.6997969091   0.5329227445     1324050
## 566   2.6009421979   2.2274791322     1400000
## 567   0.0742697719  -0.0672999284      593500
## 568  -0.4751571041  -0.1860584495      306000
## 569  -0.4629618905  -0.8708389588      799000
## 570  -0.4383230241  -0.1944793985      450000
## 571  -0.0473256064  -0.2767661129      600000
## 572  -0.5433606991  -1.1791804935      720000
## 573   0.2326492487  -0.6127290390      599950
## 574  -0.7375792267   0.2865895933      149900
## 575  -0.0271170329  -0.3014123723      406650
## 576  -0.4903249821   0.5067993272      675000
## 577   0.9980600547   1.9428760872      760000
## 578  -0.4064020669   0.5538984818      476000
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## 579  -0.3274390411  -0.0425391980       510000
## 580   1.8839012143   0.6635233291       738000
## 581   0.1287783275  -0.8316325332       479000
## 582   0.7442457628  -0.7378490169       350000
## 583   0.2703303444   0.1249141804       500000
## 584  -0.1596263776  -0.6339379136       123300
## 585   0.2355615533   0.0251023418       378000
## 586   0.1442468547  -0.7994619022       464000
## 587   1.0224786665  -0.2218354642       650000
## 588  -0.3401355848  -0.6156561680       740000
## 589  -0.5547629768  -0.1657880457       590000
## 590  -0.1982167778  -0.8789793594       320000
## 591  -0.0024509798   0.2872500939       570000
## 592   0.2161353271   0.5949187216       307450
## 593  -0.1436537396   0.3000139970       535000
## 594  -0.3977809376   0.3197323219       430000
## 595  -0.7975814765   0.9215593775      1325000
## 596  -0.2683306998   0.7379989010       659500
## 597  -0.6515595491   0.4744305647       746000
## 598   0.0950414023   0.3230230786       453000
## 599   0.3831375785   1.1135823546       505000
## 600   0.1512870287  -0.7836861011       235000
## 601  -1.1089948543  -0.4590154771      1799000
## 602   0.2458611061  -0.5882672785       310000
## 603  -0.4777651344  -0.2809694975       615000
## 604   0.2209025572   0.6046254908       575000
## 605   0.2646025379   0.1376347015       156000
## 606  -0.0650587992  -0.4860306753       728000
## 607   1.6087055195   0.4077078063      1125000
## 608  -0.2737015947  -0.2412888937       203000
## 609   0.5129079437   0.1278197364       200000
## 610  -0.1898086529  -0.6973815152       660000
## 611   0.4380770817  -1.5487941555      2288000
## 612  -0.7173395576  -0.7722639465       425000
## 613   0.0532909584  -0.1687553198       285000
## 614  -1.4467792982   1.1330101221      1500000
## 615  -0.4612101175  -0.1407836250       975000
## 616   0.0611577920  -0.0341834495       400000
## 617  -0.1263419682   0.3451726858        89950
## 618   0.7062069734   0.2919515923       870000
## 619  -0.1924433338   0.5416209165       483500
## 620   0.0397953041  -0.3876238069       387000
## 621   0.5581137523  -1.6453561028       380000
## 622   0.7515431920   0.7273993364       759000
## 623  -0.3708633959  -0.2196042558       450000
## 624  -0.3566136528   0.2125751665       485000
## 625  -0.1088769786   0.0533661245       215000
## 626   0.6452879945  -0.0056884562       325000
## 627  -0.1518739651   0.5899891632       345000
## 628   0.5593161527  -0.9570059621       402500
## 629  -0.3206536374   0.0090854795       700000
## 630  -4.4680429830  -0.8353885293      1899000
## 631   0.5734805657  -0.9973244539       480000
## 632  -0.1571008523   0.0805093960       364000
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## 633   -0.3054624440   0.1426238635       325000
## 634   -0.1181060614   0.5318871365       285000
## 635    0.1535597029  -0.7769662814       401000
## 636    0.1000287574   0.0489381515       375000
## 637   -0.2115907622   0.1556771150       680000
## 638   -0.2608951243   0.6286331933       393820
## 639   -0.6484219667  -0.8528045977       551000
## 640    0.5802326190   0.4067184971       350000
## 641    0.1621205557  -0.3069920075       580000
## 642    0.0935764012   0.3454278228       190000
## 643   -0.3046006011  -0.5368752576       530000
## 644   -3.0139168015   2.2347994447      1000000
## 645   -0.4649669057  -1.0167281235       732000
## 646   -0.9343225331  -1.6702187058       800000
## 647   -0.3117972470   1.1467815549       153503
## 648    0.1275152734  -0.6647361201      1306000
## 649   -0.2789811964   0.1944494359       315000
## 650   -0.3107784799  -0.0951569264       363000
## 651   -1.1744097165  -1.2177922327       875000
## 652   -0.4588080146  -0.0135176801       334000
## 653    0.2199417609   0.0452529315       296000
## 654    0.5189135992   0.7720988758       325000
## 655   -0.6678005842  -0.0403289029       294000
## 656   -0.4151510381   2.0535702502       590000
## 657    0.4165088593   0.2605786516       359000
## 658   -0.1439528653   0.3649104094       318500
## 659   -0.9467488931  -0.7725352206       368500
## 660   -0.1115858121  -1.2796284061       340000
## 661   -0.6436502949  -1.9286928307      1675000
## 662    0.2107519718  -1.2904903670       425000
## 663    0.3905406258  -0.4537185059       145000
## 664   -0.3314611525  -0.2806578124       850000
## 665    0.1824120662   0.2172781897       542000
## 666    0.1445619096  -0.2537199371       700000
## 667   -0.2587436842  -0.8530472741       750000
## 668    0.1767423859  -0.0436695576       144975
## 669    0.0734457161  -0.0459210550       415000
## 670   -0.1585675338  -0.0926933340       637000
## 671   -0.5476283968  -0.4685933301       895000
## 672   -0.4247539916   1.0562936065       553650
## 673   -0.2664810210   0.3425903485       225000
## 674    0.1618277528  -0.1360981042       309950
## 675   -0.5108770434   0.6470438438       726000
## 676   -0.6286320457  -0.1868787543       330000
## 677    0.0578185956  -0.1252527935       189000
## 678    0.2042564751  -0.6743038291       250000
## 679    0.3586077635   0.7075372847       420000
## 680    0.2876146900   0.3539921087       297500
## 681   -0.1311007004  -0.5806736472       475000
## 682   -0.2068634678  -0.3401920037       699000
## 683   -0.1588279936   0.6107906825       412000
## 684   -0.6910523816  -0.0925811868       762000
## 685   -0.1615560166  -0.0114587779       665000
## 686   -0.5039422257  -0.3772348939       535000
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## 687   0.0733922853   0.3029839105        275000
## 688  -0.4783752648  -0.1346056012       1225000
## 689  -0.3795339778  -0.3784844823       1078000
## 690   1.0903230875   0.0300138630        569000
## 691   0.0285022181   0.2647814571        425000
## 692  -0.0804887282  -0.2436385729        454200
## 693  -0.7276495232  -0.3070186458        749950
## 694  -0.5256508588   0.6465975368        299950
## 695  -0.1625062530   0.3416922391        445000
## 696   0.0355575681   0.3761295541        470000
## 697   0.1619370724  -0.9852611685        355000
## 698   1.3593960774  -0.7694877848        326000
## 699   0.0471148037   0.0210744259        335000
## 700  -0.8484289117   0.1491446002       1008000
## 701   0.3293940512   0.9013843455        300000
## 702   0.1345218719  -1.0549531483        325000
## 703  -0.2828699250   0.0469586747        461000
## 704  -0.1286208101  -0.3609198439        480000
## 705  -0.1223596906  -0.4125817214        299000
## 706  -0.3831624879   0.6385204483        494400
## 707  -0.1975523039  -0.3208184998        525000
## 708   0.1970105720  -0.6896776354        307000
## 709   0.0265993560   0.4582849335        330000
## 710   0.0460237222   0.5588526416        221000
## 711   0.0431744943   0.5529972175        432250
## 712   0.4420302892   0.5439892893        495000
## 713   1.8464032929   0.6494250312        630000
## 714  -0.4603950248   0.3831781436        889000
## 715   0.3802411097  -0.3064343266        502500
## 716   1.3388003605  -1.4095325707        563000
## 717  -0.2794647771   0.1290687892        280000
## 718  -0.2197656100  -0.5629354565        458950
## 719  -0.1825152859  -0.4735186849        436500
## 720   1.7007114898  -0.6041172315        510000
## 721   1.6694652443   1.0195521304        406500
## 722   0.1200894647   0.4001860430        554663
## 723  -0.6236890798   0.1919614398        938000
## 724   0.5399213715  -0.1408222163        335000
## 725   0.6558442909  -0.6121901829        695000
## 726   0.9517820774   0.0412770402        337500
## 727  -0.0980732306  -0.5060151385        435000
## 728  -0.2518219074  -0.1646765784        590000
## 729   0.0986612660   0.0439232147        281000
## 730  -0.1820847212  -0.6808761684        213500
## 731  -0.9221058969  -0.1700252733        436300
## 732   0.1561118952  -0.1496280954        361000
## 733  -0.0853845889   0.2869113115        455000
## 734   0.1257507556   0.5012320655        421000
## 735   0.3794523841  -0.4764095503        250000
## 736  -0.2811451953  -0.6431514168        360000
## 737  -0.4679423297   0.1356356678        898888
## 738  -0.3146746118   0.1270405956        672000
## 739  -0.1571945206   0.6005653315        416000
## 740  -0.1874689117  -1.3700046561        589000
```

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## 741    0.0244014290   0.7602240474      405000
## 742    0.0244014290   0.7602240474      625000
## 743   -0.1949311573   2.0589187060      345100
## 744    1.7164368240  -0.6168246467      524500
## 745    0.8045438405   0.9742572677      367777
## 746    0.0579027907  -1.2860831235      575000
## 747    0.7387692616   0.5526343040      374950
## 748    0.2904490606  -0.6604198077      255500
## 749   -0.2722851740  -0.1583620265      586000
## 750   -1.0365822533  -0.3213655608      851500
## 751   -0.3434921704   0.6483418924      637000
## 752   -0.5270491597  -0.0027235104       95000
## 753    0.0629678369   0.5993094308      772000
## 754    0.0396984925  -0.5341746892      880000
## 755   -0.0586619607  -0.1178875155      445000
## 756   -0.4254777962  -0.9580290652      549950
## 757    1.4726187017   0.3199571103      736000
## 758   -0.2631721162   0.3252400976      576750
## 759    3.4190999550   1.1708028916      495000
## 760   -0.0125376532   1.9858064510      216650
## 761    0.1112987170   0.4039845067      615000
## 762   -0.1945858760  -0.4799365490      359950
## 763    0.0570168551  -0.3548595008      265000
## 764    1.3765062878  -0.3181082872     1075000
## 765   -0.7581317849  -0.0178751535      387000
## 766   -0.2806328649   0.8138971262      589950
## 767   -0.4285239317  -0.1330509078      550000
## 768   -0.5384553780   0.3392601809      965000
## 769   -0.0063445245  -0.3209226658      357823
## 770    0.4245756512   0.3255361239      215000
## 771    1.1166462659  -0.1209313741      315000
## 772   -0.6293320852   0.1196361310      675000
## 773    0.0278537177  -0.3688674525     1145000
## 774   -0.2216869689   0.0400254769      410000
## 775    0.9357914581   0.0067088648      235500
## 776   -0.4764389815   1.5764206655      405000
## 777   -0.3700239783  -0.3603830898      276000
## 778    0.7144166066  -0.3531100663      210000
## 779    0.1663813070  -0.0928756030      310597
## 780   -0.2932359223   0.0016451102      415000
## 781   -0.3334597733   0.4398749311     1495000
## 782   -0.3212530407   0.2749417599      499900
## 783   -0.1806937412  -0.7078014156      314950
## 784   -0.3083122133  -0.9423319471      525000
## 785   -3.6958973670  -1.0467081309     2400000
## 786   -0.4665408543  -0.2203125136      820000
## 787    1.9871843489   0.9222077603     1385000
## 788   -0.7708593835  -0.4827221752      760750
## 789    0.3898039145  -0.5982281906      359950
## 790   -0.6491782924  -0.4569997995     1350000
## 791   -0.2344572321  -0.2060441100      276000
## 792    0.8210302725   1.9268357363     2150000
## 793   -0.1406446881  -0.6691114495      690000
## 794   -0.3015701721   0.3161991712      619000
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97

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## 795    0.5152836852   0.4790796999       494000
## 796    0.2311198653  -0.6187163514       339888
## 797    1.3974259290  -0.7075564753       703011
## 798   -0.1222519714  -0.5561367653       299950
## 799    0.4074009137   0.2052726107       445000
## 800   -0.3728600873   0.3964933306       462500
## 801    3.2945476083  -0.4657690863       937500
## 802    0.0094203028   0.1838495167       845000
## 803   -0.2710521763   0.3840285352       265000
## 804   -0.4061429748   0.5256963888       359950
## 805   -0.0593968639  -0.1999349074       350000
## 806    0.0538036425  -0.3615765121       441000
## 807   -0.4331388136  -0.0981537509       462600
## 808    0.1091587667  -0.0154474771       365070
## 809    0.4610750141  -0.5380583546       470000
## 810    0.5195138535  -0.1353833314       405000
## 811    0.7870770254   0.0086045312       480000
## 812   -0.0241217826  -0.0736947399       525000
## 813   -0.6938505598   0.1544250891       292000
## 814    0.9868911192  -0.5196534115       700000
## 815   -0.2881359984   0.3435542892       545000
## 816   -0.1017133005  -0.2914026835       260600
## 817   -0.4333643207   0.0433445263       415000
## 818    0.0261282711  -0.0910310500       523000
## 819   -0.4229218561  -0.3268301349       232000
## 820   -0.0157512392  -0.7369416580       245000
## 821    0.5462597678  -0.0274025393      1191000
## 822    0.5218729741  -1.2909839244       438000
## 823   -0.2668645410  -0.5493839617       790000
## 824   -0.1625357465  -0.4175958182       775000
## 825    2.5762088276   0.5458709254       360000
## 826    0.1508528268   1.2650609250       875000
## 827   -0.2593843947   0.4036113518       512500
## 828    0.0696363983  -0.0970884950       360000
## 829   -0.2110789763  -0.5182787562       527500
## 830   -0.9675331889  -0.8851157613       562000
## 831   -0.0966349881  -0.5133551228       445000
## 832   -0.5203341078   0.9753555321       729000
## 833    0.7779585323  -0.7501376853       170000
## 834    0.2417628574  -0.5970792562       210000
## 835    0.9835372678   0.6764249513       562000
## 836   -0.6361177249  -0.7961913665       585000
## 837    0.8327235761  -1.4080956072       544500
## 838    0.1178099223  -0.8522619614       394900
## 839   -0.1043373473   1.4328652108       912000
## 840    0.1337117697   0.1162234597       220000
## 841    0.7277446475  -0.9002163161       534950
## 842   -0.1763462321   0.2563620114       465000
## 843   -0.1326400657  -0.5780594684       326500
## 844   -0.7147743511   0.8847133536       537000
## 845    2.4587994917  -0.6604272978       248000
## 846   -0.1284720651   0.4053216290       340000
## 847    0.1203301701  -0.8480742411       325000
## 848   -0.1413646170  -0.3690692363       339000
```

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## 849    0.0332941277   0.2205133289     167000
## 850   -0.7218125513   0.4670223077     688000
## 851    0.2556847245  -0.5587909878     250000
## 852    0.8348768968  -0.5373874834     485000
## 853   -0.5918669839  -0.5725173304     496752
## 854    0.0365362027  -0.1694074587     227000
## 855    2.6042476342  -0.5844541960    2125000
## 856    0.2536191828  -0.5716811074     242000
## 857   -0.4531827570   0.5348937571     259950
## 858    0.4491241528   0.0138142801     352800
## 859    0.4972903698  -0.4745687560     458000
## 860   -0.0778408711  -0.4278980008     359950
## 861   -0.4566713740  -0.3753436912     939000
## 862    2.4243738996   0.9400516411     480000
## 863    3.0836576301   0.1290481646    1088890
## 864   -0.9888863385  -0.9954518300     864500
## 865    0.5487143360  -0.0923346738     285000
## 866   -0.7473474631   0.2458123086    1100000
## 867    0.1201746231  -0.1979827688     375000
## 868   -0.4180915005   0.8776193851     448000
## 869    0.1502464687  -0.7870381836     819000
## 870   -0.2190571514   2.3257666699     790000
## 871   -0.7805644991   0.3410949559     705000
## 872   -0.0619489053   0.4195948592     360000
## 873   -0.1143122429  -0.5572911423     476500
## 874   -0.3538885205  -0.7233750650     620000
## 875   -0.2291718522   0.0037236178     790000
## 876   -0.0766091612   0.7776853116     369000
## 877   -0.1531638047  -0.3980784469     415000
## 878   -0.9868980084  -0.6075993615     720000
## 879   -0.9825530381  -0.3596363424     910000
## 880    0.3210289594  -0.5969239682     294000
## 881    0.4125925760  -0.0995702766     315001
## 882   -0.7136404008   0.2620935201     360000
## 883   -0.2948988518   0.3338039635     520000
## 884    0.0840374675  -0.3196409264     474000
## 885   -3.3177911993  -0.2786974291    2000000
## 886   -0.0195242683  -0.6744310054     673200
## 887   -0.1443711178   1.5773669740     469000
## 888    0.1419231295   0.1407329558     295500
## 889   -0.8199937552   0.0489263256     567035
## 890    0.2024658205   0.1782167434     300000
## 891   -0.2025565139  -0.7231120643     535000
## 892   -0.1756480524  -0.6674178985     260000
## 893   -0.1610720518   0.3470062347     275000
## 894    2.1414568862  -0.5845865603    1236000
## 895    0.5489240655  -0.0648007857     239900
## 896   -0.7074864469  -0.0386584013     700000
## 897   -0.0368520539  -0.5450180419     221000
## 898    0.0763202284   1.5405741581     280000
## 899    2.9280923572  -0.6364518685    1260000
## 900   -0.1463009167  -0.3915508332     325000
## 901    0.7924252515   0.0172974620     530000
## 902   -0.0084753613  -0.4858484303     203000
```

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## 903    1.7158050768 -0.1383649274    1050000
## 904    0.4830857898 -0.1772702508     259950
## 905   -0.2595931593 -0.2123729092     456000
## 906    0.0892946325  0.1117286146     851000
## 907    1.2245683038  0.1272289869     900000
## 908    0.7277216373  2.5847815693     643500
## 909   -0.7566085712  0.4108481118    1206500
## 910   -0.5058938217  0.5650679877     495000
## 911    0.2044586941  0.1820450935     435000
## 912   -0.0041327281  0.6033473253     467000
## 913    2.7415228509  0.0961421548     293000
## 914    0.0082628932 -0.2319234319     181000
## 915    0.0506073397  0.2561615324     285000
## 916    0.0601895689 -0.0697739636     405000
## 917   -0.1181780453 -0.0882182299     270000
## 918    0.2264171028  0.3049646905     800000
## 919   -0.8419842401 -1.4836481053    1160000
## 920   -0.6280711631 -0.4132951768     369900
## 921   -0.2349372030 -0.3870878017     641000
## 922    0.5721703247 -0.0154839905     295000
## 923   -0.1527951365 -0.3829821624     380000
## 924    0.2299694035 -0.6463235846     238000
## 925    0.5807196474 -0.3071095289     296000
## 926   -0.0199884204  0.4221529411     390000
## 927    0.3752148553 -0.4959201536     425000
## 928   -0.5194449657  0.3106160556     605000
## 929   -0.2480102772  0.2617281950     441500
## 930    0.3775314195 -0.9310054491     540000
## 931    3.0773691358  0.1611518029    1345000
## 932   -0.0756652808  0.6663099366     758000
## 933   -0.1129912521 -0.4573086069     949880
## 934   -0.4834499131 -0.1180783158     736000
## 935   -0.5566276304 -0.4871436398    1130000
## 936    0.2295097818 -0.0704195705     610000
## 937    0.6860876773  0.3920593762     646000
## 938    0.5184854088  0.1293887190     558000
## 939    0.2862441230 -0.5130619658     333000
## 940   -0.0316548412  0.7161143235     336000
## 941   -0.5596623324  0.2265956190     600000
## 942   -0.0457506483  0.4532261387     412000
## 943    0.3836457144 -0.6959703905     440000
## 944   -0.5938138605 -0.3266110435     495000
## 945   -0.5310597667  0.5219515539     630000
## 946   -0.3278222536 -0.2684531053     248500
## 947   -0.6760990455 -0.5172382923     925000
## 948    0.0951175448  0.6599499104     425000
## 949    0.1898805849 -0.7038880818     190000
## 950    0.3437323796  0.8860023946     353000
## 951    0.0695733459 -0.1009840584     260000
## 952    0.2076830605  0.6316148188     528000
## 953   -0.4327345565 -0.3380795666     975000
## 954    0.2297409172 -0.6210914802     310000
## 955    2.3644799813 -0.8271762249     480000
## 956   -0.4797469686 -0.3595070754     248500
```

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## 957  -0.5545610027   0.2788822227      310000
## 958  -0.4480796113   0.0129568799      429000
## 959  -0.1753293564   1.1566559935      497000
## 960  -0.0520015965   0.3398955538      538000
## 961   0.2101386305  -0.6621581462      369950
## 962  -0.2957062489  -0.0168015250      310000
## 963   0.2907701882   0.1715576965      895000
## 964  -0.1733873749  -0.3556726591      650500
## 965  -0.5675024606  -0.6083906375      689000
## 966  -0.1769359892   0.2666004604      195000
## 967  -0.3059841813  -0.0855863063      339950
## 968  -0.4105788879  -0.0882434561      248000
## 969  -0.4217187791   0.8555094206      719000
## 970  -0.3402414019   0.2353283153      440000
## 971  -0.3372295920   0.6802871605      525000
## 972  -0.1659373840   0.2899683023      382500
## 973  -0.2053998184  -0.5057246125      175000
## 974  -0.5550985628   0.3731502132      715000
## 975   0.1926936711   0.2938088496      215000
## 976  -0.4559400179   0.0764362883      498800
## 977   0.5021756854   0.8372322256      849000
## 978  -0.0376327039   0.2781898405      285000
## 979  -0.2171697134   0.4346228745      275000
## 980  -0.9104638411   0.6006264829      365000
## 981  -0.1956660573  -0.0832756301      332900
## 982  -0.0396690686   0.6935527880      310000
## 983   0.1398336989  -0.2353224218      278000
## 984   0.1932585821  -0.0368381906      499900
## 985   0.6373393866   0.7662266020      620000
## 986  -0.4744347057  -0.4916314336      245000
## 987   0.2542402728  -0.7996977880      440000
## 988   0.1531385148  -0.1138536451      266500
## 989  -0.1684854598  -0.4252661294      635000
## 990  -0.6316129852  -0.1602242048      559000
## 991  -0.6167714778  -1.0181097328      895000
## 992   0.4692816708  -0.2495441455      425000
## 993   0.4445786273   0.0548992586      278000
## 994  -0.1977901081  -0.5017744850      611000
## 995   1.3166787000   0.7395681636     1000000
## 996  -1.4659796091  -1.3448274320     1575000
## 997  -0.2155702347   0.4931001214      568000
## 998   0.1407796397  -0.8321392391      210000
## 999   0.0325695638  -0.4199587197      476900
## 1000 -0.1538398843   0.3434871977      450000
## 1001 -0.5059966810  -0.2492799966      550000
## 1002 -0.3265364842  -0.2761476254      637000
## 1003 -0.1622399207  -0.1791823414      233500
## 1004  1.0818568791   0.7831523625     1025000
## 1005 -0.0615354057   1.2313306630      419950
## 1006 -0.6802453253   0.0151210997      439950
## 1007  0.1543575156  -0.7773069354      219950
## 1008 -0.5247593514  -0.6001222357      285000
## 1009 -0.1483512675  -0.3017436108      425000
## 1010 -0.5359178243   0.3740338249     1165000
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## 1011 -0.3009811156  0.0111995296      576000
## 1012  0.0701734800 -0.0957282727      324950
## 1013  2.2587935343 -0.4262972072      550000
## 1014 -0.0250790969  0.4118807659      235000
## 1015 -0.3512946123 -0.3204937363      711800
## 1016  0.2247518840 -0.3156137173     1200000
## 1017 -0.2786362100 -0.4887496525      764000
## 1018  0.2614018400 -0.1592196086      337000
## 1019  0.7693517615 -0.6953879490      249000
## 1020 -0.2624791892  1.0422589010      370000
## 1021  0.6293475754 -0.9760431316      250000
## 1022 -0.3529814798  0.4711745286      607000
## 1023 -0.0846903245  0.7051329620      731100
## 1024 -0.2846967006  0.1284665872      435000
## 1025 -0.7639516453 -0.6190706694      740000
## 1026  0.1687949919  0.4715487898      250000
## 1027 -0.2713071725 -0.6368424140      803000
## 1028 -1.1632166129 -1.1377639881      961500
## 1029  0.2749976058 -0.6925500265      267000
## 1030 -0.0202399167 -0.1188032868      310000
## 1031  0.4773805488 -0.5378906425      210000
## 1032 -0.7332458570 -0.2417710360      510000
## 1033 -0.2542659272 -0.3541205103      950000
## 1034  0.1425639052  1.0991624696      250000
## 1035 -0.1772484011  0.4087820012      320000
## 1036  1.3054366272 -0.5312607630      650000
## 1037 -0.2318136359 -0.5565015954      529888
## 1038  0.6227992213 -0.2313446127      370000
## 1039  0.2703621748 -0.5373826701      169000
## 1040 -0.5866022737 -0.1096849394      420000
## 1041 -0.1292631771 -0.3213631975     1297000
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## 1052 -0.2705725255 -0.5554941947      813000
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## 1069  0.0680919412  0.0645065217      350000
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## 1753  0.2305940338  -0.6199610460        361000
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## 1755  0.0641066616  -0.1259715287        479500
## 1756 -0.4771893168   0.7418069785        335000
## 1757 -0.6865942617  -0.8511424131        830000
## 1758 -0.0380071883   0.5340684394        500000
## 1759  1.5629319357   0.1353796383        490000
## 1760 -0.4007281924   0.0258755927        490000
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## 1762 -1.0163113218  -0.4297667523       1175000
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## 1778 -0.0994155191  -0.2177886115      750000
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## 1785 -0.8801577503   0.0775952541      560000
## 1786 -0.5332376332  -1.1632541692      725000
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## 1789  0.1402495711   0.1041865347      405000
## 1790 -0.2760565803   0.4029480584      698000
## 1791  0.3381692214  -0.5607961785      204000
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## 1807 -0.3153233438  -0.7713582866      750000
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## 1818 -0.1966149216  -0.8836745705      860000
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## 2472  0.0110631323 -0.6690505989      231000
## 2473 -0.3406092395 -0.1568794803      200000
## 2474 -0.2520022656  0.4210855699      552775
## 2475 -0.8462199250  0.7294083895      418000
## 2476 -0.1311909558 -0.5746292842      219950
## 2477 -0.0172481077  0.7395135788      300000
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## 2479 -0.1484413059  0.4680814419      595000
## 2480 -0.2887539573  0.3474605510      511555
## 2481 -0.2487658477  0.3964364166      429000
## 2482  0.3822292249 -0.4707254738      225000
## 2483  1.4877768020 -0.5966944625      615000
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## 2488 -0.2652452036  0.3906272227      615000
## 2489  1.6434194131 -0.3920088586      887500
## 2490 -0.6519294695 -0.2447633040      525000
## 2491 -0.7096990393 -1.2167428976      820000
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## 2494  1.5947797507 -0.4438096614      589000
## 2495 -0.2153149919  1.5479546094      710000
## 2496  0.5824445223 -0.2207196733      128750
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## 2499  0.0242262344 -0.0268822154      570000
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## 2505  0.3973833966  0.8488907146      741000
## 2506 -0.9004622111 -0.3461639427      575000
## 2507  0.8441019329  0.5963224573      196000
## 2508  1.7462808075 -0.1575782591      535000
## 2509  0.7220025142 -1.0119870308      215000
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## 2511 -0.6392329905 -0.1846690386      795127
## 2512 -0.1018191038 -0.5139930092      290000
## 2513  0.1731792358  0.2848111526      595000
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## 2515  0.0762796104 -0.0374689350      895000
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## 2517 -0.3401370238 -0.6167389594      160000
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## 2527  0.3936703623  0.1772159377      232900
## 2528 -0.2010650481 -0.5179796126      570500
## 2529  0.7756908477 -0.4499653189      207000
## 2530 -0.5634627249 -0.4808499516      650100
## 2531 -0.3927777153  0.0438061702      335000
## 2532  0.1919041801  0.0093711103      615000
## 2533  0.0930941375  0.0112718922      258000
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## 2542 -0.5114743900 -0.9714491550      770000
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## 2545 -0.0325635212 -0.1444185551      356000
## 2546  0.2507358911  0.2782530868      355000
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## 2557 -0.3471039261 -0.6250391044      635000
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## 2559  0.6682168921 -0.0834268079      730000
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## 2564 -0.0124383685 -0.0780766939      335000
## 2565 -0.0811614455 -0.4253864905      425000
## 2566 -0.0049150093 -1.1018709358      355000
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## 2576 -0.3182567911  0.1121479894      415000
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## 2584  2.3480411074 -0.2933452912     1313000
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## 2620 -0.0081228960 -0.4054400489      330000
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## 2622  0.2393322461 -0.6019437741      300000
## 2623  0.0765573384  0.5885647813      182700
## 2624  0.2586263689 -0.5607175863      550000
## 2625 -0.1888143501 -0.4680527368      644500
## 2626  0.0750983456 -0.0896837978      174950
## 2627  0.0640253044 -0.1132278367      300000
## 2628  0.0022396047  0.6511849048      445500
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## 2637 -0.3507744202 -0.0514076774     666570
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## 2652  0.0929059540  0.1152429237     540000
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## 2655  0.4547820698  0.7564141376     680000
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## 2658 -0.1826380913 -0.4589571949     325000
## 2659 -0.1917564641  0.0082549228     380000
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## 2662 -0.1851870067  0.1603132787     488000
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## 2673  0.0556211397  0.8509689696     260000
## 2674 -0.1449314519  0.3272105513     430000
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## 2676 -0.1172301278  0.4300236087     550000
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## 2682  0.7368678387  0.1488306221     271000
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## 2684 -0.3842379806 -0.2477072966     435000
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## 2685  3.7100121113   1.2937235422     1148000
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## 2688  2.9489871850   0.4607497395      739888
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## 2692  0.0774763649   0.6244143507      375000
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## 2703 -0.2856722995   1.5778506065      546000
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## 2705  0.5204456497   0.1557936063      360000
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## 2720 -0.1812652434  -0.6789363848      447000
## 2721  0.2746391071   0.2300423366      295500
## 2722 -0.2110214119  -0.4244331333      852500
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## 2724 -0.0518103392   0.6683691216      372000
## 2725 -0.7077625926  -0.6673181729      780000
## 2726 -0.2877539965   0.8036226563      570000
## 2727  0.8537987884  -0.0032129507      850000
## 2728 -0.6536422852   0.2050565208      390000
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## 2730 -1.2594517462  -1.1727527705     1080000
## 2731  0.2131838502  -0.6558387905      233000
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## 2746  -0.6297710720  -0.2834781431      515000
## 2747  -0.2691940284   0.1607180425      364000
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## 2777  -0.0804323465  -0.2251733735      265000
## 2778   0.1792724460   0.4132263615      600000
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## 2781  -0.3143272623   0.5183593001      650000
## 2782   0.2066400476   0.1863195938      339995
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## 2788   0.0805140816  -0.0786421751      216000
## 2789   0.0216564243  -0.2081240221      289000
## 2790  -0.4250930566   0.5741942599      610000
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## 2813 -0.2544309808  0.4135586132      380000
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## 3230  -0.2009315398   1.7408917487        431500
## 3231  -0.0605513860   0.0295211911        415000
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## 3233  -0.1160003903  -0.2136146968       1636000
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## 3237  -0.1164229655   0.3115755628        276000
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## 3254  -0.3018394210  -0.7028923877        226000
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## 3263  -0.6122226573   1.0365679967        515000
## 3264  -0.7399557555  -0.9668217303        833000
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## 3266   0.1627510437  -0.0868541568        507000
## 3267   0.0554916115   0.2908364470        427000
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## 3271   0.3255195184  -0.1073120940        329000
## 3272   0.7034952748  -0.1974486994        310000
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## 3468 -0.3575213302 -0.5434452614     630000
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## 4238 -0.0415684234  0.8380531019      468500
## 4239 -0.1253989077  0.5155132354      298000
## 4240 -0.2958484198  0.9257566314      646800
## 4241 -0.2176974626  1.1542687825     1100000
## 4242 -0.4206073127  0.7674204036      461100
## 4243 -0.4250917592  1.4635928756      552100
## 4244 -0.0095073112 -0.0120109754      615000
## 4245  0.2159462595 -0.1069706263      391000
## 4246 -0.3586640070 -0.3424178658      879950
## 4247 -0.1891217158  0.4686423195      380000
## 4248  0.4800117308  0.1272161788      288790
## 4249  0.0343503289  0.0397494854      620000
## 4250 -0.0138920067  0.1221537921      249950
```

```
## 4251 -0.2829911930 -0.4983471406      440000
## 4252  0.0040709229  0.0983931864      378950
## 4253 -0.3457412013 -0.0082564915      441750
## 4254 -0.3856798952  0.2214134197      229800
## 4255 -0.5987063194  0.1769825359      773000
## 4256 -0.2630615537  0.2305452373      480000
## 4257  0.3407152207 -0.3875502926      492500
## 4258 -0.5107318522 -0.5651046519      465000
## 4259 -0.0846581429  0.5995049307      579950
## 4260  0.2150615053  1.6167790549      580000
## 4261 -0.8885737515  0.4461535120      669000
## 4262 -0.9856886813 -0.3750594961     1698000
## 4263  1.9660252178  0.5085493721      641000
## 4264 -0.2467682138  0.7010954352      452000
## 4265 -0.0771502568 -0.2363583692      333000
## 4266 -0.1408869226 -0.0561754608      535365
## 4267 -0.2043113743  0.6525083102      565000
## 4268 -0.4684362892  0.6610020816      495000
## 4269 -0.3063647036  1.1435242473      370000
## 4270 -0.8025451804 -0.2441845622      553000
## 4271  0.0314291561  1.7766918433      331000
## 4272  1.4607733702 -0.2400904604      490000
## 4273  0.1346833065  0.5419285568      705000
## 4274 -0.0863544941 -0.2557454602      542525
## 4275  0.0690058357  0.0657808233      392000
## 4276  0.0055696879 -0.1373186794      320000
## 4277 -0.3019009533  0.1501652829      300000
## 4278 -0.4764430843  0.2980285731      782000
## 4279  0.5605592606  0.4304572732      779000
## 4280 -0.3069255406 -0.5523477578      438000
## 4281 -0.3504934155  0.4060533897      830000
## 4282 -0.6996178915  0.0532832904      695000
## 4283 -0.3972855620 -0.4222821611      869950
## 4284 -0.7983886176  0.3004603312      729999
## 4285  0.5667919027 -0.6027576324     1050000
## 4286 -0.4408598750  0.1425480372      800000
## 4287 -0.1295751835  0.5074055355      530000
## 4288 -0.7663335084  0.1305659285      250000
## 4289  0.0324514456  0.8420446711      410000
## 4290 -0.1239723334  0.5188900755      425000
## 4291 -0.1062535829 -0.1322637888      650000
## 4292  0.1725857386  0.0314343460      239950
## 4293 -0.1198974768  0.6851649587      400000
## 4294  0.2465939048 -0.5818973847      518000
## 4295 -0.1026754987  1.0392038736      535000
## 4296 -0.0225202648  0.8788350274      433000
## 4297 -0.3287666237  0.2780695350     1010800
## 4298 -0.6905653074 -0.0500288378      599832
## 4299 -0.3701564055  0.3377682687      495000
## 4300 -0.9775296511  0.1265312220     1459000
## 4301 -0.2645752805  0.3922129958      400000
## 4302 -0.2031164873 -0.4974624090      776000
## 4303 -0.0626039032  0.7905131247      420000
## 4304 -0.1474293125  1.5710169051      475000
```

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```
## 4305   1.3261256646 -0.5353413200      1378000
## 4306   0.9158786309  0.2450234351       462500
## 4307  -0.0750074340 -0.2324417675       535000
## 4308   1.2887217738 -0.1191235839       670000
## 4309   0.2488042512  0.6434732644       346000
## 4310  -0.5983376553 -0.2982697481       509900
## 4311  -0.4394385380  0.4020771733       327000
## 4312   0.0193026782 -0.5771197124       579950
## 4313  -0.6182516319 -0.3403409072       399950
## 4314  -0.1694294367  0.1922791261       362500
## 4315  -0.5223890295  0.8748805317       505000
## 4316  -0.8282499439 -0.1694847481      1222500
## 4317  -0.0368147969  0.5511300704       475000
## 4318   1.2470928017 -0.2899772825      1088000
## 4319  -0.1346146877 -0.8952303601       679950
## 4320  -0.6664067052 -0.6675472578       810000
## 4321   0.2075040894  0.1051997237       224000
## 4322  -0.1524960967  0.6237342546       360000
## 4323   0.0160746316 -0.0435109254       400000
```

```
head(test_df)
```

```
##    test_pc.PC1 test_pc.PC2 test_pc.PC3 test_pc.PC4 test_pc.PC5 test_pc.PC6
## 1   -0.5597287 -0.31217978   0.6353716  0.21982226  -0.1411868 -0.03915408
## 2   -0.2268198 -0.36561933   0.6272802  0.24523587  -0.1055819 -0.10532747
## 3    1.0234423 -0.41684921   0.5838533  0.18343668   0.3205472 -0.33789031
## 4   -1.6606144  0.18930558  -0.6832331 -0.44673093   0.1391113 -0.23576696
## 5   -1.1626257 -0.04027802  -1.1238817  0.01265443  -0.5180915  0.10246148
## 6    0.6109040 -0.45323362   0.7011749  0.31581368   0.3121636 -0.38820963
##    test_pc.PC7 test.price
## 1    0.3825643     257500
## 2    0.5576904     323000
## 3    0.1269349     662500
## 4   -0.7892788     310000
## 5   -1.1091551     485000
## 6    0.1360065     580500
```

```
pred1 <- predict(lm1, newdata=test_df)
```

```
## Warning: 'newdata' had 4323 rows but variables found have 17290 rows
```

LDA Reduction

```
library(MASS)
```

```
##
## Attaching package: 'MASS'
```

```
## The following object is masked from 'package:dplyr':
##
##     select
```

```r
lda1 <- lda(price~., data=train)
lda_pred <- predict(lda1, newdata = test)
mean(lda_pred$class==test$price)
```

[1] 0.006939625

#Evaluation I made a lot of mistakes while trying to figure out how to fix PCA and LDA and was not sure how much accuracy was lost with the reduced data.