## Oblique Principal Component Cluster Analysis

| | | | |
|---|---|---|---|
| Observations | 1388 | Proportion | 0 |
| Variables | 32 | Maxeigen | 0.6 |

Clustering algorithm converged.

| Cluster Summary for 1 Cluster | | | | | |
|---|---|---|---|---|---|
| Cluster | Members | Cluster Variation | Variation Explained | Proportion Explained | Second Eigenvalue |
| 1 | 32 | 32 | 7.665278 | 0.2395 | 2.2732 |

**Total variation explained = 7.665278 Proportion = 0.2395**

**Cluster 1 will be split because it has the largest second eigenvalue, 2.273223, which is greater than the MAXEIGEN=0.6 value.**

Clustering algorithm converged.

| Cluster Summary for 2 Clusters | | | | | |
|---|---|---|---|---|---|
| Cluster | Members | Cluster Variation | Variation Explained | Proportion Explained | Second Eigenvalue |
| 1 | 19 | 19 | 6.713918 | 0.3534 | 1.8615 |
| 2 | 13 | 13 | 2.604492 | 0.2003 | 1.5801 |

**Total variation explained = 9.31841 Proportion = 0.2912**

| 2 Clusters | | R-squared with | | |
|---|---|---|---|---|
| Cluster | Variable | Own Cluster | Next Closest | 1-R**2 Ratio |
| Cluster 1 | Gr_Liv_Area | 0.4147 | 0.1844 | 0.7176 |
| | Bsmt_Unf_SF | 0.0928 | 0.0022 | 0.9092 |
| | Age_at_Sale | 0.6109 | 0.3430 | 0.5922 |
| | Bedroom_AbvGr | 0.0922 | 0.0227 | 0.9288 |
| | High_Kitchen_Quality | 0.4601 | 0.0991 | 0.5993 |
| | fullbath_2plus | 0.6099 | 0.1482 | 0.4580 |
| | TwoPlusCar_Garage | 0.4036 | 0.1746 | 0.7226 |
| | High_Exterior_Cond | 0.0206 | 0.0039 | 0.9832 |
| | High_Exterior_Qual | 0.5740 | 0.1237 | 0.4861 |
| | One_Floor | 0.0399 | 0.0129 | 0.9726 |
| | Vinyl_Siding | 0.4265 | 0.0281 | 0.5901 |
| | Has_Fence | 0.0981 | 0.0036 | 0.9052 |
| | Poured_Concrete | 0.6122 | 0.0872 | 0.4248 |
| | Normal_Prox_Cond | 0.0229 | 0.0097 | 0.9867 |
| | AboveAverage_Quality | 0.4351 | 0.1800 | 0.6890 |
| | AboveAverage_Condition | 0.2957 | 0.0271 | 0.7239 |
| | Excellent_Heat_QC | 0.3138 | 0.0617 | 0.7314 |
| | nbr_clus1 | 0.5942 | 0.1607 | 0.4835 |
| | nbr_clus2 | 0.5969 | 0.2262 | 0.5209 |
| Cluster 2 | Total_Bsmt_SF | 0.4758 | 0.2226 | 0.6744 |
| | Bsmt_Fin_SF | 0.4278 | 0.0212 | 0.5846 |
| | Lot_Area | 0.1457 | 0.0225 | 0.8740 |
| | fireplace_1plus | 0.2453 | 0.1239 | 0.8615 |
| | CuldeSac | 0.0814 | 0.0145 | 0.9321 |
| | Land_Level | 0.0085 | 0.0006 | 0.9921 |
| | Paved_Driveway | 0.3161 | 0.0704 | 0.7357 |
| | Total_Functionality | 0.0392 | 0.0175 | 0.9779 |
| | BelowAverage_Quality | 0.2471 | 0.0749 | 0.8139 |

## Oblique Principal Component Cluster Analysis

| 2 Clusters | | R-squared with | | |
|---|---|---|---|---|
| Cluster | Variable | Own Cluster | Next Closest | 1-R**2 Ratio |
| | BelowAverage_Condition | 0.1027 | 0.0179 | 0.9136 |
| | Irreq_Lot_Shape | 0.2313 | 0.0940 | 0.8484 |
| | C_Air | 0.2781 | 0.0491 | 0.7592 |
| | nbr_clus3 | 0.0055 | 0.0001 | 0.9946 |

**Cluster 1 will be split because it has the largest second eigenvalue, 1.861523, which is greater than the MAXEIGEN=0.6 value.**

Clustering algorithm converged.

| Cluster Summary for 3 Clusters | | | | | |
|---|---|---|---|---|---|
| Cluster | Members | Cluster Variation | Variation Explained | Proportion Explained | Second Eigenvalue |
| 1 | 16 | 16 | 6.270804 | 0.3919 | 1.2772 |
| 2 | 13 | 13 | 2.604492 | 0.2003 | 1.5801 |
| 3 | 3 | 3 | 1.90735 | 0.6358 | 0.6376 |

**Total variation explained = 10.78265 Proportion = 0.3370**

| 3 Clusters | | R-squared with | | |
|---|---|---|---|---|
| Cluster | Variable | Own Cluster | Next Closest | 1-R**2 Ratio |
| Cluster 1 | Bsmt_Unf_SF | 0.0901 | 0.0177 | 0.9263 |
| | Age_at_Sale | 0.6603 | 0.3430 | 0.5170 |
| | High_Kitchen_Quality | 0.4550 | 0.0991 | 0.6049 |
| | fullbath_2plus | 0.5606 | 0.2713 | 0.6030 |
| | TwoPlusCar_Garage | 0.3946 | 0.1746 | 0.7334 |
| | High_Exterior_Cond | 0.0248 | 0.0039 | 0.9790 |
| | High_Exterior_Qual | 0.5779 | 0.1237 | 0.4817 |
| | Vinyl_Siding | 0.4627 | 0.0281 | 0.5528 |
| | Has_Fence | 0.1049 | 0.0055 | 0.9001 |
| | Poured_Concrete | 0.6396 | 0.0872 | 0.3948 |
| | Normal_Prox_Cond | 0.0260 | 0.0097 | 0.9835 |
| | AboveAverage_Quality | 0.4062 | 0.1800 | 0.7241 |
| | AboveAverage_Condition | 0.3148 | 0.0271 | 0.7043 |
| | Excellent_Heat_QC | 0.3189 | 0.0617 | 0.7259 |
| | nbr_clus1 | 0.6238 | 0.1607 | 0.4482 |
| | nbr_clus2 | 0.6106 | 0.2262 | 0.5033 |
| Cluster 2 | Total_Bsmt_SF | 0.4758 | 0.2244 | 0.6759 |
| | Bsmt_Fin_SF | 0.4278 | 0.0229 | 0.5856 |
| | Lot_Area | 0.1457 | 0.0187 | 0.8705 |
| | fireplace_1plus | 0.2453 | 0.1268 | 0.8643 |
| | CuldeSac | 0.0814 | 0.0139 | 0.9316 |
| | Land_Level | 0.0085 | 0.0009 | 0.9924 |
| | Paved_Driveway | 0.3161 | 0.0693 | 0.7348 |
| | Total_Functionality | 0.0392 | 0.0232 | 0.9836 |
| | BelowAverage_Quality | 0.2471 | 0.0651 | 0.8053 |
| | BelowAverage_Condition | 0.1027 | 0.0200 | 0.9156 |
| | Irreq_Lot_Shape | 0.2313 | 0.0942 | 0.8486 |
| | C_Air | 0.2781 | 0.0492 | 0.7593 |
| | nbr_clus3 | 0.0055 | 0.0046 | 0.9990 |
| Cluster 3 | Gr_Liv_Area | 0.6984 | 0.2998 | 0.4307 |

## Oblique Principal Component Cluster Analysis

| 3 Clusters | | R-squared with | | |
|---|---|---|---|---|
| Cluster | Variable | Own Cluster | Next Closest | 1-R**2 Ratio |
| | Bedroom_AbvGr | 0.6595 | 0.0433 | 0.3559 |
| | One_Floor | 0.5494 | 0.0138 | 0.4569 |

**Cluster 2 will be split because it has the largest second eigenvalue, 1.58009, which is greater than the MAXEIGEN=0.6 value.**

Clustering algorithm converged.

| Cluster Summary for 4 Clusters | | | | | |
|---|---|---|---|---|---|
| Cluster | Members | Cluster Variation | Variation Explained | Proportion Explained | Second Eigenvalue |
| 1 | 16 | 16 | 6.270804 | 0.3919 | 1.2772 |
| 2 | 8 | 8 | 2.133262 | 0.2667 | 1.1993 |
| 3 | 3 | 3 | 1.90735 | 0.6358 | 0.6376 |
| 4 | 5 | 5 | 1.833392 | 0.3667 | 1.0135 |

**Total variation explained = 12.14481 Proportion = 0.3795**

| 4 Clusters | | R-squared with | | |
|---|---|---|---|---|
| Cluster | Variable | Own Cluster | Next Closest | 1-R**2 Ratio |
| Cluster 1 | Bsmt_Unf_SF | 0.0901 | 0.0177 | 0.9263 |
| | Age_at_Sale | 0.6603 | 0.2206 | 0.4358 |
| | High_Kitchen_Quality | 0.4550 | 0.0867 | 0.5967 |
| | fullbath_2plus | 0.5606 | 0.2713 | 0.6030 |
| | TwoPlusCar_Garage | 0.3946 | 0.1428 | 0.7062 |
| | High_Exterior_Cond | 0.0248 | 0.0051 | 0.9802 |
| | High_Exterior_Qual | 0.5779 | 0.0937 | 0.4657 |
| | Vinyl_Siding | 0.4627 | 0.0340 | 0.5563 |
| | Has_Fence | 0.1049 | 0.0060 | 0.9005 |
| | Poured_Concrete | 0.6396 | 0.0687 | 0.3869 |
| | Normal_Prox_Cond | 0.0260 | 0.0066 | 0.9805 |
| | AboveAverage_Quality | 0.4062 | 0.1633 | 0.7097 |
| | AboveAverage_Condition | 0.3148 | 0.0513 | 0.7222 |
| | Excellent_Heat_QC | 0.3189 | 0.0605 | 0.7250 |
| | nbr_clus1 | 0.6238 | 0.1451 | 0.4401 |
| | nbr_clus2 | 0.6106 | 0.1994 | 0.4864 |
| Cluster 2 | Total_Bsmt_SF | 0.5035 | 0.2244 | 0.6402 |
| | Bsmt_Fin_SF | 0.4924 | 0.0568 | 0.5382 |
| | Lot_Area | 0.3268 | 0.0187 | 0.6860 |
| | fireplace_1plus | 0.2739 | 0.1268 | 0.8314 |
| | CuldeSac | 0.1488 | 0.0139 | 0.8632 |
| | Land_Level | 0.0631 | 0.0039 | 0.9406 |
| | Irreq_Lot_Shape | 0.3171 | 0.0942 | 0.7539 |
| | nbr_clus3 | 0.0076 | 0.0046 | 0.9970 |
| Cluster 3 | Gr_Liv_Area | 0.6984 | 0.2998 | 0.4307 |
| | Bedroom_AbvGr | 0.6595 | 0.0433 | 0.3559 |
| | One_Floor | 0.5494 | 0.0251 | 0.4622 |
| Cluster 4 | Paved_Driveway | 0.3817 | 0.0739 | 0.6676 |
| | Total_Functionality | 0.2384 | 0.0232 | 0.7797 |
| | BelowAverage_Quality | 0.3548 | 0.0651 | 0.6901 |
| | BelowAverage_Condition | 0.3807 | 0.0200 | 0.6319 |
| | C_Air | 0.4777 | 0.0492 | 0.5493 |

## Oblique Principal Component Cluster Analysis

**Cluster 1 will be split because it has the largest second eigenvalue, 1.27723, which is greater than the MAXEIGEN=0.6 value.**

Clustering algorithm converged.

| Cluster Summary for 5 Clusters | | | | | |
|---|---|---|---|---|---|
| Cluster | Members | Cluster Variation | Variation Explained | Proportion Explained | Second Eigenvalue |
| 1 | 12 | 12 | 5.820639 | 0.4851 | 1.0303 |
| 2 | 8 | 8 | 2.133262 | 0.2667 | 1.1993 |
| 3 | 3 | 3 | 1.90735 | 0.6358 | 0.6376 |
| 4 | 5 | 5 | 1.833392 | 0.3667 | 1.0135 |
| 5 | 4 | 4 | 1.506621 | 0.3767 | 0.9633 |

**Total variation explained = 13.20126 Proportion = 0.4125**

| 5 Clusters | | R-squared with | | |
|---|---|---|---|---|
| Cluster | Variable | Own Cluster | Next Closest | 1-R**2 Ratio |
| Cluster 1 | Age_at_Sale | 0.6588 | 0.2206 | 0.4378 |
| | High_Kitchen_Quality | 0.4852 | 0.0867 | 0.5637 |
| | fullbath_2plus | 0.5636 | 0.2713 | 0.5989 |
| | TwoPlusCar_Garage | 0.4010 | 0.1428 | 0.6987 |
| | High_Exterior_Qual | 0.5886 | 0.1201 | 0.4675 |
| | Vinyl_Siding | 0.4624 | 0.1091 | 0.6034 |
| | Poured_Concrete | 0.6292 | 0.2030 | 0.4652 |
| | Normal_Prox_Cond | 0.0268 | 0.0066 | 0.9797 |
| | AboveAverage_Quality | 0.4191 | 0.1633 | 0.6943 |
| | Excellent_Heat_QC | 0.3409 | 0.0605 | 0.7015 |
| | nbr_clus1 | 0.6201 | 0.1738 | 0.4598 |
| | nbr_clus2 | 0.6250 | 0.1994 | 0.4684 |
| Cluster 2 | Total_Bsmt_SF | 0.5035 | 0.2104 | 0.6288 |
| | Bsmt_Fin_SF | 0.4924 | 0.0568 | 0.5382 |
| | Lot_Area | 0.3268 | 0.0178 | 0.6854 |
| | fireplace_1plus | 0.2739 | 0.1268 | 0.8314 |
| | CuldeSac | 0.1488 | 0.0154 | 0.8645 |
| | Land_Level | 0.0631 | 0.0039 | 0.9406 |
| | Irreq_Lot_Shape | 0.3171 | 0.1002 | 0.7589 |
| | nbr_clus3 | 0.0076 | 0.0046 | 0.9970 |
| Cluster 3 | Gr_Liv_Area | 0.6984 | 0.3045 | 0.4336 |
| | Bedroom_AbvGr | 0.6595 | 0.0436 | 0.3560 |
| | One_Floor | 0.5494 | 0.0251 | 0.4622 |
| Cluster 4 | Paved_Driveway | 0.3817 | 0.0757 | 0.6689 |
| | Total_Functionality | 0.2384 | 0.0252 | 0.7813 |
| | BelowAverage_Quality | 0.3548 | 0.0748 | 0.6973 |
| | BelowAverage_Condition | 0.3807 | 0.0308 | 0.6390 |
| | C_Air | 0.4777 | 0.0586 | 0.5547 |
| Cluster 5 | Bsmt_Unf_SF | 0.3080 | 0.0596 | 0.7359 |
| | High_Exterior_Cond | 0.3496 | 0.0114 | 0.6580 |
| | Has_Fence | 0.2945 | 0.0709 | 0.7593 |
| | AboveAverage_Condition | 0.5546 | 0.2325 | 0.5804 |

**Cluster 2 will be split because it has the largest second eigenvalue, 1.199255, which is greater than the MAXEIGEN=0.6 value.**

Clustering algorithm converged.

## Oblique Principal Component Cluster Analysis

| Cluster Summary for 6 Clusters | | | | | |
|---|---|---|---|---|---|
| Cluster | Members | Cluster Variation | Variation Explained | Proportion Explained | Second Eigenvalue |
| 1 | 12 | 12 | 5.820639 | 0.4851 | 1.0303 |
| 2 | 3 | 3 | 1.719812 | 0.5733 | 0.8394 |
| 3 | 3 | 3 | 1.90735 | 0.6358 | 0.6376 |
| 4 | 5 | 5 | 1.833392 | 0.3667 | 1.0135 |
| 5 | 4 | 4 | 1.506621 | 0.3767 | 0.9633 |
| 6 | 5 | 5 | 1.548559 | 0.3097 | 1.0375 |

**Total variation explained = 14.33637 Proportion = 0.4480**

| 6 Clusters | | R-squared with | | |
|---|---|---|---|---|
| Cluster | Variable | Own Cluster | Next Closest | 1-R**2 Ratio |
| Cluster 1 | Age_at_Sale | 0.6588 | 0.2206 | 0.4378 |
| | High_Kitchen_Quality | 0.4852 | 0.0867 | 0.5637 |
| | fullbath_2plus | 0.5636 | 0.2713 | 0.5989 |
| | TwoPlusCar_Garage | 0.4010 | 0.1238 | 0.6836 |
| | High_Exterior_Qual | 0.5886 | 0.1201 | 0.4675 |
| | Vinyl_Siding | 0.4624 | 0.1091 | 0.6034 |
| | Poured_Concrete | 0.6292 | 0.2030 | 0.4652 |
| | Normal_Prox_Cond | 0.0268 | 0.0061 | 0.9792 |
| | AboveAverage_Quality | 0.4191 | 0.1633 | 0.6943 |
| | Excellent_Heat_QC | 0.3409 | 0.0605 | 0.7015 |
| | nbr_clus1 | 0.6201 | 0.1738 | 0.4598 |
| | nbr_clus2 | 0.6250 | 0.1403 | 0.4362 |
| Cluster 2 | Total_Bsmt_SF | 0.7250 | 0.2104 | 0.3482 |
| | Bsmt_Fin_SF | 0.6713 | 0.0582 | 0.3490 |
| | fireplace_1plus | 0.3235 | 0.1268 | 0.7747 |
| Cluster 3 | Gr_Liv_Area | 0.6984 | 0.3045 | 0.4336 |
| | Bedroom_AbvGr | 0.6595 | 0.0436 | 0.3560 |
| | One_Floor | 0.5494 | 0.0494 | 0.4740 |
| Cluster 4 | Paved_Driveway | 0.3817 | 0.0946 | 0.6829 |
| | Total_Functionality | 0.2384 | 0.0252 | 0.7813 |
| | BelowAverage_Quality | 0.3548 | 0.0748 | 0.6973 |
| | BelowAverage_Condition | 0.3807 | 0.0308 | 0.6390 |
| | C_Air | 0.4777 | 0.0595 | 0.5553 |
| Cluster 5 | Bsmt_Unf_SF | 0.3080 | 0.0596 | 0.7359 |
| | High_Exterior_Cond | 0.3496 | 0.0114 | 0.6580 |
| | Has_Fence | 0.2945 | 0.0709 | 0.7593 |
| | AboveAverage_Condition | 0.5546 | 0.2325 | 0.5804 |
| Cluster 6 | Lot_Area | 0.3872 | 0.0800 | 0.6661 |
| | CuldeSac | 0.4419 | 0.0154 | 0.5669 |
| | Land_Level | 0.1678 | 0.0043 | 0.8358 |
| | Irreq_Lot_Shape | 0.5279 | 0.1002 | 0.5247 |
| | nbr_clus3 | 0.0237 | 0.0046 | 0.9807 |

**Cluster 6 will be split because it has the largest second eigenvalue, 1.037528, which is greater than the MAXEIGEN=0.6 value.**

Clustering algorithm converged.

## Oblique Principal Component Cluster Analysis

| Cluster Summary for 7 Clusters | | | | | |
|---|---|---|---|---|---|
| Cluster | Members | Cluster Variation | Variation Explained | Proportion Explained | Second Eigenvalue |
| 1 | 12 | 12 | 5.820639 | 0.4851 | 1.0303 |
| 2 | 3 | 3 | 1.719812 | 0.5733 | 0.8394 |
| 3 | 3 | 3 | 1.90735 | 0.6358 | 0.6376 |
| 4 | 5 | 5 | 1.833392 | 0.3667 | 1.0135 |
| 5 | 4 | 4 | 1.506621 | 0.3767 | 0.9633 |
| 6 | 2 | 2 | 1.337849 | 0.6689 | 0.6622 |
| 7 | 3 | 3 | 1.208975 | 0.4030 | 0.9842 |

**Total variation explained = 15.33464 Proportion = 0.4792**

| 7 Clusters | | R-squared with | | |
|---|---|---|---|---|
| Cluster | Variable | Own Cluster | Next Closest | 1-R**2 Ratio |
| Cluster 1 | Age_at_Sale | 0.6588 | 0.2206 | 0.4378 |
| | High_Kitchen_Quality | 0.4852 | 0.0867 | 0.5637 |
| | fullbath_2plus | 0.5636 | 0.2713 | 0.5989 |
| | TwoPlusCar_Garage | 0.4010 | 0.1238 | 0.6836 |
| | High_Exterior_Qual | 0.5886 | 0.1201 | 0.4675 |
| | Vinyl_Siding | 0.4624 | 0.1091 | 0.6034 |
| | Poured_Concrete | 0.6292 | 0.2030 | 0.4652 |
| | Normal_Prox_Cond | 0.0268 | 0.0061 | 0.9792 |
| | AboveAverage_Quality | 0.4191 | 0.1633 | 0.6943 |
| | Excellent_Heat_QC | 0.3409 | 0.0605 | 0.7015 |
| | nbr_clus1 | 0.6201 | 0.1738 | 0.4598 |
| | nbr_clus2 | 0.6250 | 0.1403 | 0.4362 |
| Cluster 2 | Total_Bsmt_SF | 0.7250 | 0.2104 | 0.3482 |
| | Bsmt_Fin_SF | 0.6713 | 0.0568 | 0.3485 |
| | fireplace_1plus | 0.3235 | 0.1268 | 0.7747 |
| Cluster 3 | Gr_Liv_Area | 0.6984 | 0.3045 | 0.4336 |
| | Bedroom_AbvGr | 0.6595 | 0.0436 | 0.3560 |
| | One_Floor | 0.5494 | 0.0494 | 0.4740 |
| Cluster 4 | Paved_Driveway | 0.3817 | 0.0946 | 0.6829 |
| | Total_Functionality | 0.2384 | 0.0252 | 0.7813 |
| | BelowAverage_Quality | 0.3548 | 0.0748 | 0.6973 |
| | BelowAverage_Condition | 0.3807 | 0.0308 | 0.6390 |
| | C_Air | 0.4777 | 0.0595 | 0.5553 |
| Cluster 5 | Bsmt_Unf_SF | 0.3080 | 0.0596 | 0.7359 |
| | High_Exterior_Cond | 0.3496 | 0.0114 | 0.6580 |
| | Has_Fence | 0.2945 | 0.0709 | 0.7593 |
| | AboveAverage_Condition | 0.5546 | 0.2325 | 0.5804 |
| Cluster 6 | CuldeSac | 0.6689 | 0.0169 | 0.3368 |
| | Irreq_Lot_Shape | 0.6689 | 0.1002 | 0.3679 |
| Cluster 7 | Lot_Area | 0.5694 | 0.0800 | 0.4680 |
| | Land_Level | 0.5503 | 0.0074 | 0.4531 |
| | nbr_clus3 | 0.0893 | 0.0046 | 0.9149 |

**Cluster 1 will be split because it has the largest second eigenvalue, 1.03032, which is greater than the MAXEIGEN=0.6 value.**

Clustering algorithm converged.

## Oblique Principal Component Cluster Analysis

| Cluster Summary for 8 Clusters | | | | | |
|---|---|---|---|---|---|
| Cluster | Members | Cluster Variation | Variation Explained | Proportion Explained | Second Eigenvalue |
| 1 | 9 | 9 | 4.640933 | 0.5157 | 0.9950 |
| 2 | 3 | 3 | 1.719812 | 0.5733 | 0.8394 |
| 3 | 3 | 3 | 1.90735 | 0.6358 | 0.6376 |
| 4 | 5 | 5 | 1.833392 | 0.3667 | 1.0135 |
| 5 | 4 | 4 | 1.506621 | 0.3767 | 0.9633 |
| 6 | 2 | 2 | 1.337849 | 0.6689 | 0.6622 |
| 7 | 3 | 3 | 1.208975 | 0.4030 | 0.9842 |
| 8 | 3 | 3 | 2.033304 | 0.6778 | 0.5347 |

**Total variation explained = 16.18824 Proportion = 0.5059**

| 8 Clusters | | R-squared with | | |
|---|---|---|---|---|
| Cluster | Variable | Own Cluster | Next Closest | 1-R**2 Ratio |
| Cluster 1 | Age_at_Sale | 0.6701 | 0.3570 | 0.5131 |
| | High_Kitchen_Quality | 0.4956 | 0.2598 | 0.6814 |
| | High_Exterior_Qual | 0.6044 | 0.3099 | 0.5733 |
| | Vinyl_Siding | 0.5242 | 0.1686 | 0.5722 |
| | Poured_Concrete | 0.6713 | 0.2882 | 0.4617 |
| | Normal_Prox_Cond | 0.0348 | 0.0061 | 0.9712 |
| | Excellent_Heat_QC | 0.3881 | 0.1233 | 0.6979 |
| | nbr_clus1 | 0.6527 | 0.2949 | 0.4925 |
| | nbr_clus2 | 0.5996 | 0.4049 | 0.6727 |
| Cluster 2 | Total_Bsmt_SF | 0.7250 | 0.1874 | 0.3384 |
| | Bsmt_Fin_SF | 0.6713 | 0.0568 | 0.3485 |
| | fireplace_1plus | 0.3235 | 0.1707 | 0.8158 |
| Cluster 3 | Gr_Liv_Area | 0.6984 | 0.4010 | 0.5034 |
| | Bedroom_AbvGr | 0.6595 | 0.0894 | 0.3740 |
| | One_Floor | 0.5494 | 0.0550 | 0.4768 |
| Cluster 4 | Paved_Driveway | 0.3817 | 0.0946 | 0.6829 |
| | Total_Functionality | 0.2384 | 0.0278 | 0.7834 |
| | BelowAverage_Quality | 0.3548 | 0.1026 | 0.7189 |
| | BelowAverage_Condition | 0.3807 | 0.0325 | 0.6401 |
| | C_Air | 0.4777 | 0.0595 | 0.5553 |
| Cluster 5 | Bsmt_Unf_SF | 0.3080 | 0.0548 | 0.7322 |
| | High_Exterior_Cond | 0.3496 | 0.0109 | 0.6576 |
| | Has_Fence | 0.2945 | 0.0659 | 0.7552 |
| | AboveAverage_Condition | 0.5546 | 0.2320 | 0.5800 |
| Cluster 6 | CuldeSac | 0.6689 | 0.0169 | 0.3368 |
| | Irreq_Lot_Shape | 0.6689 | 0.0887 | 0.3633 |
| Cluster 7 | Lot_Area | 0.5694 | 0.0800 | 0.4680 |
| | Land_Level | 0.5503 | 0.0074 | 0.4531 |
| | nbr_clus3 | 0.0893 | 0.0046 | 0.9149 |
| Cluster 8 | fullbath_2plus | 0.7205 | 0.4139 | 0.4769 |
| | TwoPlusCar_Garage | 0.6485 | 0.2665 | 0.4792 |
| | AboveAverage_Quality | 0.6643 | 0.2810 | 0.4669 |

**Cluster 4 will be split because it has the largest second eigenvalue, 1.013512, which is greater than the MAXEIGEN=0.6 value.**

Clustering algorithm converged.

## Oblique Principal Component Cluster Analysis

| Cluster Summary for 9 Clusters | | | | | |
|---|---|---|---|---|---|
| Cluster | Members | Cluster Variation | Variation Explained | Proportion Explained | Second Eigenvalue |
| 1 | 9 | 9 | 4.640933 | 0.5157 | 0.9950 |
| 2 | 3 | 3 | 1.719812 | 0.5733 | 0.8394 |
| 3 | 3 | 3 | 1.90735 | 0.6358 | 0.6376 |
| 4 | 3 | 3 | 1.545621 | 0.5152 | 0.8067 |
| 5 | 4 | 4 | 1.506621 | 0.3767 | 0.9633 |
| 6 | 2 | 2 | 1.337849 | 0.6689 | 0.6622 |
| 7 | 3 | 3 | 1.208975 | 0.4030 | 0.9842 |
| 8 | 3 | 3 | 2.033304 | 0.6778 | 0.5347 |
| 9 | 2 | 2 | 1.271317 | 0.6357 | 0.7287 |

**Total variation explained = 17.17178 Proportion = 0.5366**

| 9 Clusters | | R-squared with | | |
|---|---|---|---|---|
| Cluster | Variable | Own Cluster | Next Closest | 1-R**2 Ratio |
| Cluster 1 | Age_at_Sale | 0.6701 | 0.3570 | 0.5131 |
| | High_Kitchen_Quality | 0.4956 | 0.2598 | 0.6814 |
| | High_Exterior_Qual | 0.6044 | 0.3099 | 0.5733 |
| | Vinyl_Siding | 0.5242 | 0.1686 | 0.5722 |
| | Poured_Concrete | 0.6713 | 0.2882 | 0.4617 |
| | Normal_Prox_Cond | 0.0348 | 0.0061 | 0.9712 |
| | Excellent_Heat_QC | 0.3881 | 0.1233 | 0.6979 |
| | nbr_clus1 | 0.6527 | 0.2949 | 0.4925 |
| | nbr_clus2 | 0.5996 | 0.4049 | 0.6727 |
| Cluster 2 | Total_Bsmt_SF | 0.7250 | 0.1874 | 0.3384 |
| | Bsmt_Fin_SF | 0.6713 | 0.0785 | 0.3567 |
| | fireplace_1plus | 0.3235 | 0.1707 | 0.8158 |
| Cluster 3 | Gr_Liv_Area | 0.6984 | 0.4010 | 0.5034 |
| | Bedroom_AbvGr | 0.6595 | 0.0894 | 0.3740 |
| | One_Floor | 0.5494 | 0.0550 | 0.4768 |
| Cluster 4 | Paved_Driveway | 0.5643 | 0.0946 | 0.4812 |
| | BelowAverage_Quality | 0.4048 | 0.1026 | 0.6632 |
| | C_Air | 0.5765 | 0.0595 | 0.4503 |
| Cluster 5 | Bsmt_Unf_SF | 0.3080 | 0.0548 | 0.7322 |
| | High_Exterior_Cond | 0.3496 | 0.0109 | 0.6576 |
| | Has_Fence | 0.2945 | 0.0659 | 0.7552 |
| | AboveAverage_Condition | 0.5546 | 0.2320 | 0.5800 |
| Cluster 6 | CuldeSac | 0.6689 | 0.0169 | 0.3368 |
| | Irreq_Lot_Shape | 0.6689 | 0.0887 | 0.3633 |
| Cluster 7 | Lot_Area | 0.5694 | 0.0800 | 0.4680 |
| | Land_Level | 0.5503 | 0.0074 | 0.4531 |
| | nbr_clus3 | 0.0893 | 0.0046 | 0.9149 |
| Cluster 8 | fullbath_2plus | 0.7205 | 0.4139 | 0.4769 |
| | TwoPlusCar_Garage | 0.6485 | 0.2665 | 0.4792 |
| | AboveAverage_Quality | 0.6643 | 0.2810 | 0.4669 |
| Cluster 9 | Total_Functionality | 0.6357 | 0.0302 | 0.3757 |
| | BelowAverage_Condition | 0.6357 | 0.0758 | 0.3942 |

**Cluster 1 will be split because it has the largest second eigenvalue, 0.99502, which is greater than the MAXEIGEN=0.6 value.**

## Oblique Principal Component Cluster Analysis

Clustering algorithm converged.

| Cluster Summary for 10 Clusters | | | | | |
|---|---|---|---|---|---|
| Cluster | Members | Cluster Variation | Variation Explained | Proportion Explained | Second Eigenvalue |
| 1 | 8 | 8 | 4.613458 | 0.5767 | 0.8517 |
| 2 | 3 | 3 | 1.719812 | 0.5733 | 0.8394 |
| 3 | 3 | 3 | 1.90735 | 0.6358 | 0.6376 |
| 4 | 3 | 3 | 1.545621 | 0.5152 | 0.8067 |
| 5 | 4 | 4 | 1.506621 | 0.3767 | 0.9633 |
| 6 | 2 | 2 | 1.337849 | 0.6689 | 0.6622 |
| 7 | 3 | 3 | 1.208975 | 0.4030 | 0.9842 |
| 8 | 3 | 3 | 2.033304 | 0.6778 | 0.5347 |
| 9 | 2 | 2 | 1.271317 | 0.6357 | 0.7287 |
| 10 | 1 | 1 | 1 | 1.0000 | |

**Total variation explained = 18.14431 Proportion = 0.5670**

| 10 Clusters | | R-squared with | | |
|---|---|---|---|---|
| Cluster | Variable | Own Cluster | Next Closest | 1-R**2 Ratio |
| Cluster 1 | Age_at_Sale | 0.6686 | 0.3570 | 0.5155 |
| | High_Kitchen_Quality | 0.4973 | 0.2598 | 0.6792 |
| | High_Exterior_Qual | 0.6049 | 0.3099 | 0.5725 |
| | Vinyl_Siding | 0.5266 | 0.1686 | 0.5693 |
| | Poured_Concrete | 0.6742 | 0.2882 | 0.4578 |
| | Excellent_Heat_QC | 0.3910 | 0.1233 | 0.6947 |
| | nbr_clus1 | 0.6516 | 0.2949 | 0.4941 |
| | nbr_clus2 | 0.5993 | 0.4049 | 0.6732 |
| Cluster 2 | Total_Bsmt_SF | 0.7250 | 0.1865 | 0.3380 |
| | Bsmt_Fin_SF | 0.6713 | 0.0785 | 0.3567 |
| | fireplace_1plus | 0.3235 | 0.1707 | 0.8158 |
| Cluster 3 | Gr_Liv_Area | 0.6984 | 0.4010 | 0.5034 |
| | Bedroom_AbvGr | 0.6595 | 0.0894 | 0.3740 |
| | One_Floor | 0.5494 | 0.0550 | 0.4768 |
| Cluster 4 | Paved_Driveway | 0.5643 | 0.0946 | 0.4812 |
| | BelowAverage_Quality | 0.4048 | 0.1026 | 0.6632 |
| | C_Air | 0.5765 | 0.0595 | 0.4503 |
| Cluster 5 | Bsmt_Unf_SF | 0.3080 | 0.0548 | 0.7322 |
| | High_Exterior_Cond | 0.3496 | 0.0109 | 0.6576 |
| | Has_Fence | 0.2945 | 0.0658 | 0.7552 |
| | AboveAverage_Condition | 0.5546 | 0.2324 | 0.5803 |
| Cluster 6 | CuldeSac | 0.6689 | 0.0169 | 0.3368 |
| | Irreq_Lot_Shape | 0.6689 | 0.0886 | 0.3632 |
| Cluster 7 | Lot_Area | 0.5694 | 0.0800 | 0.4680 |
| | Land_Level | 0.5503 | 0.0074 | 0.4531 |
| | nbr_clus3 | 0.0893 | 0.0046 | 0.9149 |
| Cluster 8 | fullbath_2plus | 0.7205 | 0.4156 | 0.4783 |
| | TwoPlusCar_Garage | 0.6485 | 0.2684 | 0.4804 |
| | AboveAverage_Quality | 0.6643 | 0.2820 | 0.4675 |
| Cluster 9 | Total_Functionality | 0.6357 | 0.0302 | 0.3757 |
| | BelowAverage_Condition | 0.6357 | 0.0758 | 0.3942 |
| Cluster 10 | Normal_Prox_Cond | 1.0000 | 0.0217 | 0.0000 |

**Oblique Principal Component Cluster Analysis**

**Cluster 7 will be split because it has the largest second eigenvalue, 0.984173, which is greater than the MAXEIGEN=0.6 value.**

Clustering algorithm converged.

| Cluster Summary for 11 Clusters | | | | | |
|---|---|---|---|---|---|
| Cluster | Members | Cluster Variation | Variation Explained | Proportion Explained | Second Eigenvalue |
| 1 | 8 | 8 | 4.613458 | 0.5767 | 0.8517 |
| 2 | 3 | 3 | 1.719812 | 0.5733 | 0.8394 |
| 3 | 3 | 3 | 1.90735 | 0.6358 | 0.6376 |
| 4 | 3 | 3 | 1.545621 | 0.5152 | 0.8067 |
| 5 | 4 | 4 | 1.506621 | 0.3767 | 0.9633 |
| 6 | 2 | 2 | 1.337849 | 0.6689 | 0.6622 |
| 7 | 2 | 2 | 1.192342 | 0.5962 | 0.8077 |
| 8 | 3 | 3 | 2.033304 | 0.6778 | 0.5347 |
| 9 | 2 | 2 | 1.271317 | 0.6357 | 0.7287 |
| 10 | 1 | 1 | 1 | 1.0000 | |
| 11 | 1 | 1 | 1 | 1.0000 | |

**Total variation explained = 19.12767 Proportion = 0.5977**

| 11 Clusters | | R-squared with | | |
|---|---|---|---|---|
| Cluster | Variable | Own Cluster | Next Closest | 1-R**2 Ratio |
| Cluster 1 | Age_at_Sale | 0.6686 | 0.3570 | 0.5155 |
| | High_Kitchen_Quality | 0.4973 | 0.2598 | 0.6792 |
| | High_Exterior_Qual | 0.6049 | 0.3099 | 0.5725 |
| | Vinyl_Siding | 0.5266 | 0.1686 | 0.5693 |
| | Poured_Concrete | 0.6742 | 0.2882 | 0.4578 |
| | Excellent_Heat_QC | 0.3910 | 0.1233 | 0.6947 |
| | nbr_clus1 | 0.6516 | 0.2949 | 0.4941 |
| | nbr_clus2 | 0.5993 | 0.4049 | 0.6732 |
| Cluster 2 | Total_Bsmt_SF | 0.7250 | 0.1865 | 0.3380 |
| | Bsmt_Fin_SF | 0.6713 | 0.0785 | 0.3567 |
| | fireplace_1plus | 0.3235 | 0.1707 | 0.8158 |
| Cluster 3 | Gr_Liv_Area | 0.6984 | 0.4010 | 0.5034 |
| | Bedroom_AbvGr | 0.6595 | 0.0894 | 0.3740 |
| | One_Floor | 0.5494 | 0.0550 | 0.4768 |
| Cluster 4 | Paved_Driveway | 0.5643 | 0.0946 | 0.4812 |
| | BelowAverage_Quality | 0.4048 | 0.1026 | 0.6632 |
| | C_Air | 0.5765 | 0.0595 | 0.4503 |
| Cluster 5 | Bsmt_Unf_SF | 0.3080 | 0.0548 | 0.7322 |
| | High_Exterior_Cond | 0.3496 | 0.0109 | 0.6576 |
| | Has_Fence | 0.2945 | 0.0658 | 0.7552 |
| | AboveAverage_Condition | 0.5546 | 0.2324 | 0.5803 |
| Cluster 6 | CuldeSac | 0.6689 | 0.0164 | 0.3366 |
| | Irreq_Lot_Shape | 0.6689 | 0.0886 | 0.3632 |
| Cluster 7 | Lot_Area | 0.5962 | 0.0800 | 0.4390 |
| | Land_Level | 0.5962 | 0.0074 | 0.4068 |
| Cluster 8 | fullbath_2plus | 0.7205 | 0.4156 | 0.4783 |
| | TwoPlusCar_Garage | 0.6485 | 0.2684 | 0.4804 |
| | AboveAverage_Quality | 0.6643 | 0.2820 | 0.4675 |
| Cluster 9 | Total_Functionality | 0.6357 | 0.0302 | 0.3757 |
| | BelowAverage_Condition | 0.6357 | 0.0758 | 0.3942 |

## Oblique Principal Component Cluster Analysis

| 11 Clusters | | R-squared with | | |
|---|---|---|---|---|
| Cluster | Variable | Own Cluster | Next Closest | 1-R**2 Ratio |
| Cluster 10 | Normal_Prox_Cond | 1.0000 | 0.0217 | 0.0000 |
| Cluster 11 | nbr_clus3 | 1.0000 | 0.0046 | 0.0000 |

**Cluster 5 will be split because it has the largest second eigenvalue, 0.963315, which is greater than the MAXEIGEN=0.6 value.**

Clustering algorithm converged.

| Cluster Summary for 12 Clusters | | | | | |
|---|---|---|---|---|---|
| Cluster | Members | Cluster Variation | Variation Explained | Proportion Explained | Second Eigenvalue |
| 1 | 8 | 8 | 4.613458 | 0.5767 | 0.8517 |
| 2 | 3 | 3 | 1.719812 | 0.5733 | 0.8394 |
| 3 | 3 | 3 | 1.90735 | 0.6358 | 0.6376 |
| 4 | 3 | 3 | 1.545621 | 0.5152 | 0.8067 |
| 5 | 2 | 2 | 1.154712 | 0.5774 | 0.8453 |
| 6 | 2 | 2 | 1.337849 | 0.6689 | 0.6622 |
| 7 | 2 | 2 | 1.192342 | 0.5962 | 0.8077 |
| 8 | 3 | 3 | 2.033304 | 0.6778 | 0.5347 |
| 9 | 2 | 2 | 1.271317 | 0.6357 | 0.7287 |
| 10 | 1 | 1 | 1 | 1.0000 | |
| 11 | 1 | 1 | 1 | 1.0000 | |
| 12 | 2 | 2 | 1.279369 | 0.6397 | 0.7206 |

**Total variation explained = 20.05514 Proportion = 0.6267**

| 12 Clusters | | R-squared with | | |
|---|---|---|---|---|
| Cluster | Variable | Own Cluster | Next Closest | 1-R**2 Ratio |
| Cluster 1 | Age_at_Sale | 0.6686 | 0.3570 | 0.5155 |
| | High_Kitchen_Quality | 0.4973 | 0.2598 | 0.6792 |
| | High_Exterior_Qual | 0.6049 | 0.3099 | 0.5725 |
| | Vinyl_Siding | 0.5266 | 0.1686 | 0.5693 |
| | Poured_Concrete | 0.6742 | 0.2882 | 0.4578 |
| | Excellent_Heat_QC | 0.3910 | 0.1233 | 0.6947 |
| | nbr_clus1 | 0.6516 | 0.2949 | 0.4941 |
| | nbr_clus2 | 0.5993 | 0.4049 | 0.6732 |
| Cluster 2 | Total_Bsmt_SF | 0.7250 | 0.1865 | 0.3380 |
| | Bsmt_Fin_SF | 0.6713 | 0.1617 | 0.3921 |
| | fireplace_1plus | 0.3235 | 0.1707 | 0.8158 |
| Cluster 3 | Gr_Liv_Area | 0.6984 | 0.4010 | 0.5034 |
| | Bedroom_AbvGr | 0.6595 | 0.0894 | 0.3740 |
| | One_Floor | 0.5494 | 0.0550 | 0.4768 |
| Cluster 4 | Paved_Driveway | 0.5643 | 0.0946 | 0.4812 |
| | BelowAverage_Quality | 0.4048 | 0.1026 | 0.6632 |
| | C_Air | 0.5765 | 0.0595 | 0.4503 |
| Cluster 5 | Bsmt_Unf_SF | 0.5774 | 0.0548 | 0.4472 |
| | Has_Fence | 0.5774 | 0.0658 | 0.4524 |
| Cluster 6 | CuldeSac | 0.6689 | 0.0164 | 0.3366 |
| | Irreq_Lot_Shape | 0.6689 | 0.0886 | 0.3632 |
| Cluster 7 | Lot_Area | 0.5962 | 0.0800 | 0.4390 |
| | Land_Level | 0.5962 | 0.0074 | 0.4068 |

## Oblique Principal Component Cluster Analysis

| 12 Clusters | | R-squared with | | |
|---|---|---|---|---|
| Cluster | Variable | Own Cluster | Next Closest | 1-R**2 Ratio |
| Cluster 8 | fullbath_2plus | 0.7205 | 0.4156 | 0.4783 |
| | TwoPlusCar_Garage | 0.6485 | 0.2684 | 0.4804 |
| | AboveAverage_Quality | 0.6643 | 0.2820 | 0.4675 |
| Cluster 9 | Total_Functionality | 0.6357 | 0.0302 | 0.3757 |
| | BelowAverage_Condition | 0.6357 | 0.0758 | 0.3942 |
| Cluster 10 | Normal_Prox_Cond | 1.0000 | 0.0217 | 0.0000 |
| Cluster 11 | nbr_clus3 | 1.0000 | 0.0049 | 0.0000 |
| Cluster 12 | High_Exterior_Cond | 0.6397 | 0.0120 | 0.3647 |
| | AboveAverage_Condition | 0.6397 | 0.2324 | 0.4694 |

**Cluster 1 will be split because it has the largest second eigenvalue, 0.851749, which is greater than the MAXEIGEN=0.6 value.**

Clustering algorithm converged.

| Cluster Summary for 13 Clusters | | | | | |
|---|---|---|---|---|---|
| Cluster | Members | Cluster Variation | Variation Explained | Proportion Explained | Second Eigenvalue |
| 1 | 5 | 5 | 3.376281 | 0.6753 | 0.6030 |
| 2 | 3 | 3 | 1.719812 | 0.5733 | 0.8394 |
| 3 | 3 | 3 | 1.90735 | 0.6358 | 0.6376 |
| 4 | 3 | 3 | 1.545621 | 0.5152 | 0.8067 |
| 5 | 2 | 2 | 1.154712 | 0.5774 | 0.8453 |
| 6 | 2 | 2 | 1.337849 | 0.6689 | 0.6622 |
| 7 | 2 | 2 | 1.192342 | 0.5962 | 0.8077 |
| 8 | 3 | 3 | 2.033304 | 0.6778 | 0.5347 |
| 9 | 2 | 2 | 1.271317 | 0.6357 | 0.7287 |
| 10 | 1 | 1 | 1 | 1.0000 | |
| 11 | 1 | 1 | 1 | 1.0000 | |
| 12 | 2 | 2 | 1.279369 | 0.6397 | 0.7206 |
| 13 | 3 | 3 | 2.028662 | 0.6762 | 0.5962 |

**Total variation explained = 20.84662 Proportion = 0.6515**

| 13 Clusters | | R-squared with | | |
|---|---|---|---|---|
| Cluster | Variable | Own Cluster | Next Closest | 1-R**2 Ratio |
| Cluster 1 | Age_at_Sale | 0.7430 | 0.3570 | 0.3996 |
| | Vinyl_Siding | 0.5484 | 0.2884 | 0.6346 |
| | Poured_Concrete | 0.6870 | 0.3900 | 0.5131 |
| | nbr_clus1 | 0.7229 | 0.3083 | 0.4006 |
| | nbr_clus2 | 0.6749 | 0.4049 | 0.5462 |
| Cluster 2 | Total_Bsmt_SF | 0.7250 | 0.1737 | 0.3328 |
| | Bsmt_Fin_SF | 0.6713 | 0.1617 | 0.3921 |
| | fireplace_1plus | 0.3235 | 0.1707 | 0.8158 |
| Cluster 3 | Gr_Liv_Area | 0.6984 | 0.4010 | 0.5034 |
| | Bedroom_AbvGr | 0.6595 | 0.0894 | 0.3740 |
| | One_Floor | 0.5494 | 0.0550 | 0.4768 |
| Cluster 4 | Paved_Driveway | 0.5643 | 0.0946 | 0.4812 |
| | BelowAverage_Quality | 0.4048 | 0.1026 | 0.6632 |
| | C_Air | 0.5765 | 0.0595 | 0.4503 |
| Cluster 5 | Bsmt_Unf_SF | 0.5774 | 0.0548 | 0.4472 |

## Oblique Principal Component Cluster Analysis

| 13 Clusters | | R-squared with | | |
|---|---|---|---|---|
| Cluster | Variable | Own Cluster | Next Closest | 1-R**2 Ratio |
| | Has_Fence | 0.5774 | 0.0655 | 0.4523 |
| Cluster 6 | CuldeSac | 0.6689 | 0.0167 | 0.3367 |
| | Irreq_Lot_Shape | 0.6689 | 0.0997 | 0.3677 |
| Cluster 7 | Lot_Area | 0.5962 | 0.0800 | 0.4390 |
| | Land_Level | 0.5962 | 0.0074 | 0.4068 |
| Cluster 8 | fullbath_2plus | 0.7205 | 0.3903 | 0.4584 |
| | TwoPlusCar_Garage | 0.6485 | 0.2736 | 0.4839 |
| | AboveAverage_Quality | 0.6643 | 0.2440 | 0.4441 |
| Cluster 9 | Total_Functionality | 0.6357 | 0.0302 | 0.3757 |
| | BelowAverage_Condition | 0.6357 | 0.0758 | 0.3942 |
| Cluster 10 | Normal_Prox_Cond | 1.0000 | 0.0224 | 0.0000 |
| Cluster 11 | nbr_clus3 | 1.0000 | 0.0049 | 0.0000 |
| Cluster 12 | High_Exterior_Cond | 0.6397 | 0.0211 | 0.3681 |
| | AboveAverage_Condition | 0.6397 | 0.2742 | 0.4964 |
| Cluster 13 | High_Kitchen_Quality | 0.7197 | 0.3017 | 0.4014 |
| | High_Exterior_Qual | 0.7362 | 0.4097 | 0.4468 |
| | Excellent_Heat_QC | 0.5727 | 0.2364 | 0.5595 |

**Cluster 5 will be split because it has the largest second eigenvalue, 0.845288, which is greater than the MAXEIGEN=0.6 value.**

Clustering algorithm converged.

| Cluster Summary for 14 Clusters | | | | | |
|---|---|---|---|---|---|
| Cluster | Members | Cluster Variation | Variation Explained | Proportion Explained | Second Eigenvalue |
| 1 | 5 | 5 | 3.376281 | 0.6753 | 0.6030 |
| 2 | 3 | 3 | 1.719812 | 0.5733 | 0.8394 |
| 3 | 3 | 3 | 1.90735 | 0.6358 | 0.6376 |
| 4 | 3 | 3 | 1.545621 | 0.5152 | 0.8067 |
| 5 | 1 | 1 | 1 | 1.0000 | |
| 6 | 2 | 2 | 1.337849 | 0.6689 | 0.6622 |
| 7 | 2 | 2 | 1.192342 | 0.5962 | 0.8077 |
| 8 | 3 | 3 | 2.033304 | 0.6778 | 0.5347 |
| 9 | 2 | 2 | 1.271317 | 0.6357 | 0.7287 |
| 10 | 1 | 1 | 1 | 1.0000 | |
| 11 | 1 | 1 | 1 | 1.0000 | |
| 12 | 2 | 2 | 1.279369 | 0.6397 | 0.7206 |
| 13 | 3 | 3 | 2.028662 | 0.6762 | 0.5962 |
| 14 | 1 | 1 | 1 | 1.0000 | |

**Total variation explained = 21.69191 Proportion = 0.6779**

| 14 Clusters | | R-squared with | | |
|---|---|---|---|---|
| Cluster | Variable | Own Cluster | Next Closest | 1-R**2 Ratio |
| Cluster 1 | Age_at_Sale | 0.7430 | 0.3570 | 0.3996 |
| | Vinyl_Siding | 0.5484 | 0.2884 | 0.6346 |
| | Poured_Concrete | 0.6870 | 0.3900 | 0.5131 |
| | nbr_clus1 | 0.7229 | 0.3083 | 0.4006 |
| | nbr_clus2 | 0.6749 | 0.4049 | 0.5462 |
| Cluster 2 | Total_Bsmt_SF | 0.7250 | 0.1737 | 0.3328 |

## Oblique Principal Component Cluster Analysis

| 14 Clusters | | R-squared with | | |
|---|---|---|---|---|
| Cluster | Variable | Own Cluster | Next Closest | 1-R**2 Ratio |
| | Bsmt_Fin_SF | 0.6713 | 0.3213 | 0.4843 |
| | fireplace_1plus | 0.3235 | 0.1707 | 0.8158 |
| Cluster 3 | Gr_Liv_Area | 0.6984 | 0.4010 | 0.5034 |
| | Bedroom_AbvGr | 0.6595 | 0.0894 | 0.3740 |
| | One_Floor | 0.5494 | 0.0550 | 0.4768 |
| Cluster 4 | Paved_Driveway | 0.5643 | 0.0946 | 0.4812 |
| | BelowAverage_Quality | 0.4048 | 0.1026 | 0.6632 |
| | C_Air | 0.5765 | 0.0595 | 0.4503 |
| Cluster 5 | Bsmt_Unf_SF | 1.0000 | 0.0548 | 0.0000 |
| Cluster 6 | CuldeSac | 0.6689 | 0.0167 | 0.3367 |
| | Irreq_Lot_Shape | 0.6689 | 0.0997 | 0.3677 |
| Cluster 7 | Lot_Area | 0.5962 | 0.0800 | 0.4390 |
| | Land_Level | 0.5962 | 0.0074 | 0.4068 |
| Cluster 8 | fullbath_2plus | 0.7205 | 0.3903 | 0.4584 |
| | TwoPlusCar_Garage | 0.6485 | 0.2736 | 0.4839 |
| | AboveAverage_Quality | 0.6643 | 0.2440 | 0.4441 |
| Cluster 9 | Total_Functionality | 0.6357 | 0.0302 | 0.3757 |
| | BelowAverage_Condition | 0.6357 | 0.0758 | 0.3942 |
| Cluster 10 | Normal_Prox_Cond | 1.0000 | 0.0224 | 0.0000 |
| Cluster 11 | nbr_clus3 | 1.0000 | 0.0046 | 0.0000 |
| Cluster 12 | High_Exterior_Cond | 0.6397 | 0.0211 | 0.3681 |
| | AboveAverage_Condition | 0.6397 | 0.2742 | 0.4964 |
| Cluster 13 | High_Kitchen_Quality | 0.7197 | 0.3017 | 0.4014 |
| | High_Exterior_Qual | 0.7362 | 0.4097 | 0.4468 |
| | Excellent_Heat_QC | 0.5727 | 0.2364 | 0.5595 |
| Cluster 14 | Has_Fence | 1.0000 | 0.0655 | 0.0000 |

**Cluster 2 will be split because it has the largest second eigenvalue, 0.839398, which is greater than the MAXEIGEN=0.6 value.**

Clustering algorithm converged.

| Cluster Summary for 15 Clusters | | | | | |
|---|---|---|---|---|---|
| Cluster | Members | Cluster Variation | Variation Explained | Proportion Explained | Second Eigenvalue |
| 1 | 5 | 5 | 3.376281 | 0.6753 | 0.6030 |
| 2 | 2 | 2 | 1.55347 | 0.7767 | 0.4465 |
| 3 | 3 | 3 | 1.90735 | 0.6358 | 0.6376 |
| 4 | 3 | 3 | 1.545621 | 0.5152 | 0.8067 |
| 5 | 1 | 1 | 1 | 1.0000 | |
| 6 | 2 | 2 | 1.337849 | 0.6689 | 0.6622 |
| 7 | 2 | 2 | 1.192342 | 0.5962 | 0.8077 |
| 8 | 3 | 3 | 2.033304 | 0.6778 | 0.5347 |
| 9 | 2 | 2 | 1.271317 | 0.6357 | 0.7287 |
| 10 | 1 | 1 | 1 | 1.0000 | |
| 11 | 1 | 1 | 1 | 1.0000 | |
| 12 | 2 | 2 | 1.279369 | 0.6397 | 0.7206 |
| 13 | 3 | 3 | 2.028662 | 0.6762 | 0.5962 |
| 14 | 1 | 1 | 1 | 1.0000 | |
| 15 | 1 | 1 | 1 | 1.0000 | |

## Oblique Principal Component Cluster Analysis

**Total variation explained = 22.52557 Proportion = 0.7039**

| 15 Clusters | | R-squared with | | |
|---|---|---|---|---|
| Cluster | Variable | Own Cluster | Next Closest | 1-R**2 Ratio |
| Cluster 1 | Age_at_Sale | 0.7430 | 0.3570 | 0.3996 |
| | Vinyl_Siding | 0.5484 | 0.2884 | 0.6346 |
| | Poured_Concrete | 0.6870 | 0.3900 | 0.5131 |
| | nbr_clus1 | 0.7229 | 0.3083 | 0.4006 |
| | nbr_clus2 | 0.6749 | 0.4049 | 0.5462 |
| Cluster 2 | Total_Bsmt_SF | 0.7767 | 0.1737 | 0.2702 |
| | Bsmt_Fin_SF | 0.7767 | 0.3213 | 0.3289 |
| Cluster 3 | Gr_Liv_Area | 0.6984 | 0.4010 | 0.5034 |
| | Bedroom_AbvGr | 0.6595 | 0.0894 | 0.3740 |
| | One_Floor | 0.5494 | 0.1062 | 0.5041 |
| Cluster 4 | Paved_Driveway | 0.5643 | 0.0882 | 0.4778 |
| | BelowAverage_Quality | 0.4048 | 0.1026 | 0.6632 |
| | C_Air | 0.5765 | 0.0577 | 0.4495 |
| Cluster 5 | Bsmt_Unf_SF | 1.0000 | 0.0548 | 0.0000 |
| Cluster 6 | CuldeSac | 0.6689 | 0.0167 | 0.3367 |
| | Irreq_Lot_Shape | 0.6689 | 0.0997 | 0.3677 |
| Cluster 7 | Lot_Area | 0.5962 | 0.0692 | 0.4338 |
| | Land_Level | 0.5962 | 0.0074 | 0.4068 |
| Cluster 8 | fullbath_2plus | 0.7205 | 0.3903 | 0.4584 |
| | TwoPlusCar_Garage | 0.6485 | 0.2736 | 0.4839 |
| | AboveAverage_Quality | 0.6643 | 0.2440 | 0.4441 |
| Cluster 9 | Total_Functionality | 0.6357 | 0.0302 | 0.3757 |
| | BelowAverage_Condition | 0.6357 | 0.0758 | 0.3942 |
| Cluster 10 | Normal_Prox_Cond | 1.0000 | 0.0224 | 0.0000 |
| Cluster 11 | nbr_clus3 | 1.0000 | 0.0046 | 0.0000 |
| Cluster 12 | High_Exterior_Cond | 0.6397 | 0.0211 | 0.3681 |
| | AboveAverage_Condition | 0.6397 | 0.2742 | 0.4964 |
| Cluster 13 | High_Kitchen_Quality | 0.7197 | 0.3017 | 0.4014 |
| | High_Exterior_Qual | 0.7362 | 0.4097 | 0.4468 |
| | Excellent_Heat_QC | 0.5727 | 0.2364 | 0.5595 |
| Cluster 14 | Has_Fence | 1.0000 | 0.0655 | 0.0000 |
| Cluster 15 | fireplace_1plus | 1.0000 | 0.1707 | 0.0000 |

**Cluster 7 will be split because it has the largest second eigenvalue, 0.807658, which is greater than the MAXEIGEN=0.6 value.**

Clustering algorithm converged.

| Cluster Summary for 16 Clusters | | | | | |
|---|---|---|---|---|---|
| Cluster | Members | Cluster Variation | Variation Explained | Proportion Explained | Second Eigenvalue |
| 1 | 5 | 5 | 3.376281 | 0.6753 | 0.6030 |
| 2 | 2 | 2 | 1.55347 | 0.7767 | 0.4465 |
| 3 | 3 | 3 | 1.90735 | 0.6358 | 0.6376 |
| 4 | 3 | 3 | 1.545621 | 0.5152 | 0.8067 |
| 5 | 1 | 1 | 1 | 1.0000 | |
| 6 | 2 | 2 | 1.337849 | 0.6689 | 0.6622 |
| 7 | 1 | 1 | 1 | 1.0000 | |
| 8 | 3 | 3 | 2.033304 | 0.6778 | 0.5347 |

## Oblique Principal Component Cluster Analysis

| Cluster Summary for 16 Clusters | | | | | |
|---|---|---|---|---|---|
| Cluster | Members | Cluster Variation | Variation Explained | Proportion Explained | Second Eigenvalue |
| 9 | 2 | 2 | 1.271317 | 0.6357 | 0.7287 |
| 10 | 1 | 1 | 1 | 1.0000 | |
| 11 | 1 | 1 | 1 | 1.0000 | |
| 12 | 2 | 2 | 1.279369 | 0.6397 | 0.7206 |
| 13 | 3 | 3 | 2.028662 | 0.6762 | 0.5962 |
| 14 | 1 | 1 | 1 | 1.0000 | |
| 15 | 1 | 1 | 1 | 1.0000 | |
| 16 | 1 | 1 | 1 | 1.0000 | |

**Total variation explained = 23.33322 Proportion = 0.7292**

| 16 Clusters | | R-squared with | | |
|---|---|---|---|---|
| Cluster | Variable | Own Cluster | Next Closest | 1-R**2 Ratio |
| Cluster 1 | Age_at_Sale | 0.7430 | 0.3570 | 0.3996 |
| | Vinyl_Siding | 0.5484 | 0.2884 | 0.6346 |
| | Poured_Concrete | 0.6870 | 0.3900 | 0.5131 |
| | nbr_clus1 | 0.7229 | 0.3083 | 0.4006 |
| | nbr_clus2 | 0.6749 | 0.4049 | 0.5462 |
| Cluster 2 | Total_Bsmt_SF | 0.7767 | 0.1737 | 0.2702 |
| | Bsmt_Fin_SF | 0.7767 | 0.3213 | 0.3289 |
| Cluster 3 | Gr_Liv_Area | 0.6984 | 0.4010 | 0.5034 |
| | Bedroom_AbvGr | 0.6595 | 0.0894 | 0.3740 |
| | One_Floor | 0.5494 | 0.1062 | 0.5041 |
| Cluster 4 | Paved_Driveway | 0.5643 | 0.0882 | 0.4778 |
| | BelowAverage_Quality | 0.4048 | 0.1026 | 0.6632 |
| | C_Air | 0.5765 | 0.0577 | 0.4495 |
| Cluster 5 | Bsmt_Unf_SF | 1.0000 | 0.0548 | 0.0000 |
| Cluster 6 | CuldeSac | 0.6689 | 0.0255 | 0.3397 |
| | Irreq_Lot_Shape | 0.6689 | 0.0997 | 0.3677 |
| Cluster 7 | Lot_Area | 1.0000 | 0.0692 | 0.0000 |
| Cluster 8 | fullbath_2plus | 0.7205 | 0.3903 | 0.4584 |
| | TwoPlusCar_Garage | 0.6485 | 0.2736 | 0.4839 |
| | AboveAverage_Quality | 0.6643 | 0.2440 | 0.4441 |
| Cluster 9 | Total_Functionality | 0.6357 | 0.0302 | 0.3757 |
| | BelowAverage_Condition | 0.6357 | 0.0758 | 0.3942 |
| Cluster 10 | Normal_Prox_Cond | 1.0000 | 0.0224 | 0.0000 |
| Cluster 11 | nbr_clus3 | 1.0000 | 0.0046 | 0.0000 |
| Cluster 12 | High_Exterior_Cond | 0.6397 | 0.0211 | 0.3681 |
| | AboveAverage_Condition | 0.6397 | 0.2742 | 0.4964 |
| Cluster 13 | High_Kitchen_Quality | 0.7197 | 0.3017 | 0.4014 |
| | High_Exterior_Qual | 0.7362 | 0.4097 | 0.4468 |
| | Excellent_Heat_QC | 0.5727 | 0.2364 | 0.5595 |
| Cluster 14 | Has_Fence | 1.0000 | 0.0655 | 0.0000 |
| Cluster 15 | fireplace_1plus | 1.0000 | 0.1707 | 0.0000 |
| Cluster 16 | Land_Level | 1.0000 | 0.0370 | 0.0000 |

**Cluster 4 will be split because it has the largest second eigenvalue, 0.806703, which is greater than the MAXEIGEN=0.6 value.**

Clustering algorithm converged.

## Oblique Principal Component Cluster Analysis

| Cluster Summary for 17 Clusters | | | | | |
|---|---|---|---|---|---|
| Cluster | Members | Cluster Variation | Variation Explained | Proportion Explained | Second Eigenvalue |
| 1 | 5 | 5 | 3.376281 | 0.6753 | 0.6030 |
| 2 | 2 | 2 | 1.55347 | 0.7767 | 0.4465 |
| 3 | 3 | 3 | 1.90735 | 0.6358 | 0.6376 |
| 4 | 2 | 2 | 1.352005 | 0.6760 | 0.6480 |
| 5 | 1 | 1 | 1 | 1.0000 | |
| 6 | 2 | 2 | 1.337849 | 0.6689 | 0.6622 |
| 7 | 1 | 1 | 1 | 1.0000 | |
| 8 | 3 | 3 | 2.033304 | 0.6778 | 0.5347 |
| 9 | 2 | 2 | 1.271317 | 0.6357 | 0.7287 |
| 10 | 1 | 1 | 1 | 1.0000 | |
| 11 | 1 | 1 | 1 | 1.0000 | |
| 12 | 2 | 2 | 1.279369 | 0.6397 | 0.7206 |
| 13 | 3 | 3 | 2.028662 | 0.6762 | 0.5962 |
| 14 | 1 | 1 | 1 | 1.0000 | |
| 15 | 1 | 1 | 1 | 1.0000 | |
| 16 | 1 | 1 | 1 | 1.0000 | |
| 17 | 1 | 1 | 1 | 1.0000 | |

**Total variation explained = 24.13961 Proportion = 0.7544**

| 17 Clusters | | R-squared with | | |
|---|---|---|---|---|
| Cluster | Variable | Own Cluster | Next Closest | 1-R**2 Ratio |
| Cluster 1 | Age_at_Sale | 0.7430 | 0.3570 | 0.3996 |
| | Vinyl_Siding | 0.5484 | 0.2884 | 0.6346 |
| | Poured_Concrete | 0.6870 | 0.3900 | 0.5131 |
| | nbr_clus1 | 0.7229 | 0.3083 | 0.4006 |
| | nbr_clus2 | 0.6749 | 0.4049 | 0.5462 |
| Cluster 2 | Total_Bsmt_SF | 0.7767 | 0.1737 | 0.2702 |
| | Bsmt_Fin_SF | 0.7767 | 0.3213 | 0.3289 |
| Cluster 3 | Gr_Liv_Area | 0.6984 | 0.4010 | 0.5034 |
| | Bedroom_AbvGr | 0.6595 | 0.0894 | 0.3740 |
| | One_Floor | 0.5494 | 0.1062 | 0.5041 |
| Cluster 4 | Paved_Driveway | 0.6760 | 0.0882 | 0.3553 |
| | C_Air | 0.6760 | 0.0577 | 0.3438 |
| Cluster 5 | Bsmt_Unf_SF | 1.0000 | 0.0548 | 0.0000 |
| Cluster 6 | CuldeSac | 0.6689 | 0.0255 | 0.3397 |
| | Irreq_Lot_Shape | 0.6689 | 0.0997 | 0.3677 |
| Cluster 7 | Lot_Area | 1.0000 | 0.0692 | 0.0000 |
| Cluster 8 | fullbath_2plus | 0.7205 | 0.3903 | 0.4584 |
| | TwoPlusCar_Garage | 0.6485 | 0.2736 | 0.4839 |
| | AboveAverage_Quality | 0.6643 | 0.2440 | 0.4441 |
| Cluster 9 | Total_Functionality | 0.6357 | 0.0279 | 0.3748 |
| | BelowAverage_Condition | 0.6357 | 0.0556 | 0.3858 |
| Cluster 10 | Normal_Prox_Cond | 1.0000 | 0.0224 | 0.0000 |
| Cluster 11 | nbr_clus3 | 1.0000 | 0.0046 | 0.0000 |
| Cluster 12 | High_Exterior_Cond | 0.6397 | 0.0211 | 0.3681 |
| | AboveAverage_Condition | 0.6397 | 0.2742 | 0.4964 |
| Cluster 13 | High_Kitchen_Quality | 0.7197 | 0.3017 | 0.4014 |
| | High_Exterior_Qual | 0.7362 | 0.4097 | 0.4468 |

## Oblique Principal Component Cluster Analysis

| 17 Clusters | | R-squared with | | |
|---|---|---|---|---|
| Cluster | Variable | Own Cluster | Next Closest | 1-R**2 Ratio |
| | Excellent_Heat_QC | 0.5727 | 0.2364 | 0.5595 |
| Cluster 14 | Has_Fence | 1.0000 | 0.0655 | 0.0000 |
| Cluster 15 | fireplace_1plus | 1.0000 | 0.1707 | 0.0000 |
| Cluster 16 | Land_Level | 1.0000 | 0.0370 | 0.0000 |
| Cluster 17 | BelowAverage_Quality | 1.0000 | 0.1026 | 0.0000 |

**Cluster 9 will be split because it has the largest second eigenvalue, 0.728683, which is greater than the MAXEIGEN=0.6 value.**

Clustering algorithm converged.

| Cluster Summary for 18 Clusters | | | | | |
|---|---|---|---|---|---|
| Cluster | Members | Cluster Variation | Variation Explained | Proportion Explained | Second Eigenvalue |
| 1 | 5 | 5 | 3.376281 | 0.6753 | 0.6030 |
| 2 | 2 | 2 | 1.55347 | 0.7767 | 0.4465 |
| 3 | 3 | 3 | 1.90735 | 0.6358 | 0.6376 |
| 4 | 2 | 2 | 1.352005 | 0.6760 | 0.6480 |
| 5 | 1 | 1 | 1 | 1.0000 | |
| 6 | 2 | 2 | 1.337849 | 0.6689 | 0.6622 |
| 7 | 1 | 1 | 1 | 1.0000 | |
| 8 | 3 | 3 | 2.033304 | 0.6778 | 0.5347 |
| 9 | 1 | 1 | 1 | 1.0000 | |
| 10 | 1 | 1 | 1 | 1.0000 | |
| 11 | 1 | 1 | 1 | 1.0000 | |
| 12 | 2 | 2 | 1.279369 | 0.6397 | 0.7206 |
| 13 | 3 | 3 | 2.028662 | 0.6762 | 0.5962 |
| 14 | 1 | 1 | 1 | 1.0000 | |
| 15 | 1 | 1 | 1 | 1.0000 | |
| 16 | 1 | 1 | 1 | 1.0000 | |
| 17 | 1 | 1 | 1 | 1.0000 | |
| 18 | 1 | 1 | 1 | 1.0000 | |

**Total variation explained = 24.86829 Proportion = 0.7771**

| 18 Clusters | | R-squared with | | |
|---|---|---|---|---|
| Cluster | Variable | Own Cluster | Next Closest | 1-R**2 Ratio |
| Cluster 1 | Age_at_Sale | 0.7430 | 0.3570 | 0.3996 |
| | Vinyl_Siding | 0.5484 | 0.2884 | 0.6346 |
| | Poured_Concrete | 0.6870 | 0.3900 | 0.5131 |
| | nbr_clus1 | 0.7229 | 0.3083 | 0.4006 |
| | nbr_clus2 | 0.6749 | 0.4049 | 0.5462 |
| Cluster 2 | Total_Bsmt_SF | 0.7767 | 0.1737 | 0.2702 |
| | Bsmt_Fin_SF | 0.7767 | 0.3213 | 0.3289 |
| Cluster 3 | Gr_Liv_Area | 0.6984 | 0.4010 | 0.5034 |
| | Bedroom_AbvGr | 0.6595 | 0.0894 | 0.3740 |
| | One_Floor | 0.5494 | 0.1062 | 0.5041 |
| Cluster 4 | Paved_Driveway | 0.6760 | 0.0882 | 0.3553 |
| | C_Air | 0.6760 | 0.0620 | 0.3454 |
| Cluster 5 | Bsmt_Unf_SF | 1.0000 | 0.0548 | 0.0000 |
| Cluster 6 | CuldeSac | 0.6689 | 0.0255 | 0.3397 |

## Oblique Principal Component Cluster Analysis

| 18 Clusters | | R-squared with | | |
|---|---|---|---|---|
| Cluster | Variable | Own Cluster | Next Closest | 1-R**2 Ratio |
| | Irreq_Lot_Shape | 0.6689 | 0.0997 | 0.3677 |
| Cluster 7 | Lot_Area | 1.0000 | 0.0692 | 0.0000 |
| Cluster 8 | fullbath_2plus | 0.7205 | 0.3903 | 0.4584 |
| | TwoPlusCar_Garage | 0.6485 | 0.2736 | 0.4839 |
| | AboveAverage_Quality | 0.6643 | 0.2440 | 0.4441 |
| Cluster 9 | Total_Functionality | 1.0000 | 0.0736 | 0.0000 |
| Cluster 10 | Normal_Prox_Cond | 1.0000 | 0.0224 | 0.0000 |
| Cluster 11 | nbr_clus3 | 1.0000 | 0.0046 | 0.0000 |
| Cluster 12 | High_Exterior_Cond | 0.6397 | 0.0211 | 0.3681 |
| | AboveAverage_Condition | 0.6397 | 0.2742 | 0.4964 |
| Cluster 13 | High_Kitchen_Quality | 0.7197 | 0.3017 | 0.4014 |
| | High_Exterior_Qual | 0.7362 | 0.4097 | 0.4468 |
| | Excellent_Heat_QC | 0.5727 | 0.2364 | 0.5595 |
| Cluster 14 | Has_Fence | 1.0000 | 0.0655 | 0.0000 |
| Cluster 15 | fireplace_1plus | 1.0000 | 0.1707 | 0.0000 |
| Cluster 16 | Land_Level | 1.0000 | 0.0370 | 0.0000 |
| Cluster 17 | BelowAverage_Quality | 1.0000 | 0.1026 | 0.0000 |
| Cluster 18 | BelowAverage_Condition | 1.0000 | 0.0736 | 0.0000 |

**Cluster 12 will be split because it has the largest second eigenvalue, 0.720631, which is greater than the MAXEIGEN=0.6 value.**

Clustering algorithm converged.

| Cluster Summary for 19 Clusters | | | | | |
|---|---|---|---|---|---|
| Cluster | Members | Cluster Variation | Variation Explained | Proportion Explained | Second Eigenvalue |
| 1 | 5 | 5 | 3.376281 | 0.6753 | 0.6030 |
| 2 | 2 | 2 | 1.55347 | 0.7767 | 0.4465 |
| 3 | 3 | 3 | 1.90735 | 0.6358 | 0.6376 |
| 4 | 2 | 2 | 1.352005 | 0.6760 | 0.6480 |
| 5 | 1 | 1 | 1 | 1.0000 | |
| 6 | 2 | 2 | 1.337849 | 0.6689 | 0.6622 |
| 7 | 1 | 1 | 1 | 1.0000 | |
| 8 | 3 | 3 | 2.033304 | 0.6778 | 0.5347 |
| 9 | 1 | 1 | 1 | 1.0000 | |
| 10 | 1 | 1 | 1 | 1.0000 | |
| 11 | 1 | 1 | 1 | 1.0000 | |
| 12 | 1 | 1 | 1 | 1.0000 | |
| 13 | 3 | 3 | 2.028662 | 0.6762 | 0.5962 |
| 14 | 1 | 1 | 1 | 1.0000 | |
| 15 | 1 | 1 | 1 | 1.0000 | |
| 16 | 1 | 1 | 1 | 1.0000 | |
| 17 | 1 | 1 | 1 | 1.0000 | |
| 18 | 1 | 1 | 1 | 1.0000 | |
| 19 | 1 | 1 | 1 | 1.0000 | |

**Total variation explained = 25.58892 Proportion = 0.7997**

## Oblique Principal Component Cluster Analysis

| 19 Clusters | | R-squared with | | |
|---|---|---|---|---|
| Cluster | Variable | Own Cluster | Next Closest | 1-R**2 Ratio |
| Cluster 1 | Age_at_Sale | 0.7430 | 0.3570 | 0.3996 |
| | Vinyl_Siding | 0.5484 | 0.2884 | 0.6346 |
| | Poured_Concrete | 0.6870 | 0.3900 | 0.5131 |
| | nbr_clus1 | 0.7229 | 0.3083 | 0.4006 |
| | nbr_clus2 | 0.6749 | 0.4049 | 0.5462 |
| Cluster 2 | Total_Bsmt_SF | 0.7767 | 0.1737 | 0.2702 |
| | Bsmt_Fin_SF | 0.7767 | 0.3213 | 0.3289 |
| Cluster 3 | Gr_Liv_Area | 0.6984 | 0.4010 | 0.5034 |
| | Bedroom_AbvGr | 0.6595 | 0.0894 | 0.3740 |
| | One_Floor | 0.5494 | 0.1062 | 0.5041 |
| Cluster 4 | Paved_Driveway | 0.6760 | 0.0882 | 0.3553 |
| | C_Air | 0.6760 | 0.0620 | 0.3454 |
| Cluster 5 | Bsmt_Unf_SF | 1.0000 | 0.0548 | 0.0000 |
| Cluster 6 | CuldeSac | 0.6689 | 0.0255 | 0.3397 |
| | Irreq_Lot_Shape | 0.6689 | 0.0997 | 0.3677 |
| Cluster 7 | Lot_Area | 1.0000 | 0.0692 | 0.0000 |
| Cluster 8 | fullbath_2plus | 0.7205 | 0.3903 | 0.4584 |
| | TwoPlusCar_Garage | 0.6485 | 0.2736 | 0.4839 |
| | AboveAverage_Quality | 0.6643 | 0.2440 | 0.4441 |
| Cluster 9 | Total_Functionality | 1.0000 | 0.0736 | 0.0000 |
| Cluster 10 | Normal_Prox_Cond | 1.0000 | 0.0224 | 0.0000 |
| Cluster 11 | nbr_clus3 | 1.0000 | 0.0046 | 0.0000 |
| Cluster 12 | AboveAverage_Condition | 1.0000 | 0.2742 | 0.0000 |
| Cluster 13 | High_Kitchen_Quality | 0.7197 | 0.3017 | 0.4014 |
| | High_Exterior_Qual | 0.7362 | 0.4097 | 0.4468 |
| | Excellent_Heat_QC | 0.5727 | 0.2364 | 0.5595 |
| Cluster 14 | Has_Fence | 1.0000 | 0.0655 | 0.0000 |
| Cluster 15 | fireplace_1plus | 1.0000 | 0.1707 | 0.0000 |
| Cluster 16 | Land_Level | 1.0000 | 0.0370 | 0.0000 |
| Cluster 17 | BelowAverage_Quality | 1.0000 | 0.1026 | 0.0000 |
| Cluster 18 | BelowAverage_Condition | 1.0000 | 0.0736 | 0.0000 |
| Cluster 19 | High_Exterior_Cond | 1.0000 | 0.0780 | 0.0000 |

**Cluster 6 will be split because it has the largest second eigenvalue, 0.662151, which is greater than the MAXEIGEN=0.6 value.**

Clustering algorithm converged.

| Cluster Summary for 20 Clusters | | | | | |
|---|---|---|---|---|---|
| Cluster | Members | Cluster Variation | Variation Explained | Proportion Explained | Second Eigenvalue |
| 1 | 5 | 5 | 3.376281 | 0.6753 | 0.6030 |
| 2 | 2 | 2 | 1.55347 | 0.7767 | 0.4465 |
| 3 | 3 | 3 | 1.90735 | 0.6358 | 0.6376 |
| 4 | 2 | 2 | 1.352005 | 0.6760 | 0.6480 |
| 5 | 1 | 1 | 1 | 1.0000 | |
| 6 | 1 | 1 | 1 | 1.0000 | |
| 7 | 1 | 1 | 1 | 1.0000 | |
| 8 | 3 | 3 | 2.033304 | 0.6778 | 0.5347 |

## Oblique Principal Component Cluster Analysis

| Cluster Summary for 20 Clusters | | | | | |
|---|---|---|---|---|---|
| Cluster | Members | Cluster Variation | Variation Explained | Proportion Explained | Second Eigenvalue |
| 9 | 1 | 1 | 1 | 1.0000 | |
| 10 | 1 | 1 | 1 | 1.0000 | |
| 11 | 1 | 1 | 1 | 1.0000 | |
| 12 | 1 | 1 | 1 | 1.0000 | |
| 13 | 3 | 3 | 2.028662 | 0.6762 | 0.5962 |
| 14 | 1 | 1 | 1 | 1.0000 | |
| 15 | 1 | 1 | 1 | 1.0000 | |
| 16 | 1 | 1 | 1 | 1.0000 | |
| 17 | 1 | 1 | 1 | 1.0000 | |
| 18 | 1 | 1 | 1 | 1.0000 | |
| 19 | 1 | 1 | 1 | 1.0000 | |
| 20 | 1 | 1 | 1 | 1.0000 | |

**Total variation explained = 26.25107 Proportion = 0.8203**

| 20 Clusters | | R-squared with | | |
|---|---|---|---|---|
| Cluster | Variable | Own Cluster | Next Closest | 1-R**2 Ratio |
| Cluster 1 | Age_at_Sale | 0.7430 | 0.3570 | 0.3996 |
| | Vinyl_Siding | 0.5484 | 0.2884 | 0.6346 |
| | Poured_Concrete | 0.6870 | 0.3900 | 0.5131 |
| | nbr_clus1 | 0.7229 | 0.3083 | 0.4006 |
| | nbr_clus2 | 0.6749 | 0.4049 | 0.5462 |
| Cluster 2 | Total_Bsmt_SF | 0.7767 | 0.1737 | 0.2702 |
| | Bsmt_Fin_SF | 0.7767 | 0.3213 | 0.3289 |
| Cluster 3 | Gr_Liv_Area | 0.6984 | 0.4010 | 0.5034 |
| | Bedroom_AbvGr | 0.6595 | 0.0894 | 0.3740 |
| | One_Floor | 0.5494 | 0.1062 | 0.5041 |
| Cluster 4 | Paved_Driveway | 0.6760 | 0.0882 | 0.3553 |
| | C_Air | 0.6760 | 0.0620 | 0.3454 |
| Cluster 5 | Bsmt_Unf_SF | 1.0000 | 0.0548 | 0.0000 |
| Cluster 6 | CuldeSac | 1.0000 | 0.1141 | 0.0000 |
| Cluster 7 | Lot_Area | 1.0000 | 0.0692 | 0.0000 |
| Cluster 8 | fullbath_2plus | 0.7205 | 0.3903 | 0.4584 |
| | TwoPlusCar_Garage | 0.6485 | 0.2736 | 0.4839 |
| | AboveAverage_Quality | 0.6643 | 0.2440 | 0.4441 |
| Cluster 9 | Total_Functionality | 1.0000 | 0.0736 | 0.0000 |
| Cluster 10 | Normal_Prox_Cond | 1.0000 | 0.0224 | 0.0000 |
| Cluster 11 | nbr_clus3 | 1.0000 | 0.0046 | 0.0000 |
| Cluster 12 | AboveAverage_Condition | 1.0000 | 0.2742 | 0.0000 |
| Cluster 13 | High_Kitchen_Quality | 0.7197 | 0.3017 | 0.4014 |
| | High_Exterior_Qual | 0.7362 | 0.4097 | 0.4468 |
| | Excellent_Heat_QC | 0.5727 | 0.2364 | 0.5595 |
| Cluster 14 | Has_Fence | 1.0000 | 0.0655 | 0.0000 |
| Cluster 15 | fireplace_1plus | 1.0000 | 0.1707 | 0.0000 |
| Cluster 16 | Land_Level | 1.0000 | 0.0370 | 0.0000 |
| Cluster 17 | BelowAverage_Quality | 1.0000 | 0.1026 | 0.0000 |
| Cluster 18 | BelowAverage_Condition | 1.0000 | 0.0736 | 0.0000 |

## Oblique Principal Component Cluster Analysis

| 20 Clusters | | R-squared with | | |
|---|---|---|---|---|
| Cluster | Variable | Own Cluster | Next Closest | 1-R**2 Ratio |
| Cluster 19 | High_Exterior_Cond | 1.0000 | 0.0780 | 0.0000 |
| Cluster 20 | Irreq_Lot_Shape | 1.0000 | 0.1141 | 0.0000 |

**Cluster 4 will be split because it has the largest second eigenvalue, 0.647995, which is greater than the MAXEIGEN=0.6 value.**

Clustering algorithm converged.

| Cluster Summary for 21 Clusters | | | | | |
|---|---|---|---|---|---|
| Cluster | Members | Cluster Variation | Variation Explained | Proportion Explained | Second Eigenvalue |
| 1 | 5 | 5 | 3.376281 | 0.6753 | 0.6030 |
| 2 | 2 | 2 | 1.55347 | 0.7767 | 0.4465 |
| 3 | 3 | 3 | 1.90735 | 0.6358 | 0.6376 |
| 4 | 1 | 1 | 1 | 1.0000 | |
| 5 | 1 | 1 | 1 | 1.0000 | |
| 6 | 1 | 1 | 1 | 1.0000 | |
| 7 | 1 | 1 | 1 | 1.0000 | |
| 8 | 3 | 3 | 2.033304 | 0.6778 | 0.5347 |
| 9 | 1 | 1 | 1 | 1.0000 | |
| 10 | 1 | 1 | 1 | 1.0000 | |
| 11 | 1 | 1 | 1 | 1.0000 | |
| 12 | 1 | 1 | 1 | 1.0000 | |
| 13 | 3 | 3 | 2.028662 | 0.6762 | 0.5962 |
| 14 | 1 | 1 | 1 | 1.0000 | |
| 15 | 1 | 1 | 1 | 1.0000 | |
| 16 | 1 | 1 | 1 | 1.0000 | |
| 17 | 1 | 1 | 1 | 1.0000 | |
| 18 | 1 | 1 | 1 | 1.0000 | |
| 19 | 1 | 1 | 1 | 1.0000 | |
| 20 | 1 | 1 | 1 | 1.0000 | |
| 21 | 1 | 1 | 1 | 1.0000 | |

**Total variation explained = 26.89907 Proportion = 0.8406**

| 21 Clusters | | R-squared with | | |
|---|---|---|---|---|
| Cluster | Variable | Own Cluster | Next Closest | 1-R**2 Ratio |
| Cluster 1 | Age_at_Sale | 0.7430 | 0.3570 | 0.3996 |
| | Vinyl_Siding | 0.5484 | 0.2884 | 0.6346 |
| | Poured_Concrete | 0.6870 | 0.3900 | 0.5131 |
| | nbr_clus1 | 0.7229 | 0.3083 | 0.4006 |
| | nbr_clus2 | 0.6749 | 0.4049 | 0.5462 |
| Cluster 2 | Total_Bsmt_SF | 0.7767 | 0.1737 | 0.2702 |
| | Bsmt_Fin_SF | 0.7767 | 0.3213 | 0.3289 |
| Cluster 3 | Gr_Liv_Area | 0.6984 | 0.4010 | 0.5034 |
| | Bedroom_AbvGr | 0.6595 | 0.0894 | 0.3740 |
| | One_Floor | 0.5494 | 0.1062 | 0.5041 |
| Cluster 4 | Paved_Driveway | 1.0000 | 0.1239 | 0.0000 |
| Cluster 5 | Bsmt_Unf_SF | 1.0000 | 0.0548 | 0.0000 |
| Cluster 6 | CuldeSac | 1.0000 | 0.1141 | 0.0000 |
| Cluster 7 | Lot_Area | 1.0000 | 0.0692 | 0.0000 |

## Oblique Principal Component Cluster Analysis

| 21 Clusters | | R-squared with | | |
|---|---|---|---|---|
| Cluster | Variable | Own Cluster | Next Closest | 1-R**2 Ratio |
| Cluster 8 | fullbath_2plus | 0.7205 | 0.3903 | 0.4584 |
| | TwoPlusCar_Garage | 0.6485 | 0.2736 | 0.4839 |
| | AboveAverage_Quality | 0.6643 | 0.2440 | 0.4441 |
| Cluster 9 | Total_Functionality | 1.0000 | 0.0736 | 0.0000 |
| Cluster 10 | Normal_Prox_Cond | 1.0000 | 0.0224 | 0.0000 |
| Cluster 11 | nbr_clus3 | 1.0000 | 0.0046 | 0.0000 |
| Cluster 12 | AboveAverage_Condition | 1.0000 | 0.2742 | 0.0000 |
| Cluster 13 | High_Kitchen_Quality | 0.7197 | 0.3017 | 0.4014 |
| | High_Exterior_Qual | 0.7362 | 0.4097 | 0.4468 |
| | Excellent_Heat_QC | 0.5727 | 0.2364 | 0.5595 |
| Cluster 14 | Has_Fence | 1.0000 | 0.0655 | 0.0000 |
| Cluster 15 | fireplace_1plus | 1.0000 | 0.1707 | 0.0000 |
| Cluster 16 | Land_Level | 1.0000 | 0.0370 | 0.0000 |
| Cluster 17 | BelowAverage_Quality | 1.0000 | 0.1026 | 0.0000 |
| Cluster 18 | BelowAverage_Condition | 1.0000 | 0.0736 | 0.0000 |
| Cluster 19 | High_Exterior_Cond | 1.0000 | 0.0780 | 0.0000 |
| Cluster 20 | Irreq_Lot_Shape | 1.0000 | 0.1141 | 0.0000 |
| Cluster 21 | C_Air | 1.0000 | 0.1239 | 0.0000 |

**Cluster 3 will be split because it has the largest second eigenvalue, 0.637553, which is greater than the MAXEIGEN=0.6 value.**

Clustering algorithm converged.

| Cluster Summary for 22 Clusters | | | | | |
|---|---|---|---|---|---|
| Cluster | Members | Cluster Variation | Variation Explained | Proportion Explained | Second Eigenvalue |
| 1 | 5 | 5 | 3.376281 | 0.6753 | 0.6030 |
| 2 | 2 | 2 | 1.55347 | 0.7767 | 0.4465 |
| 3 | 2 | 2 | 1.540439 | 0.7702 | 0.4596 |
| 4 | 1 | 1 | 1 | 1.0000 | |
| 5 | 1 | 1 | 1 | 1.0000 | |
| 6 | 1 | 1 | 1 | 1.0000 | |
| 7 | 1 | 1 | 1 | 1.0000 | |
| 8 | 3 | 3 | 2.033304 | 0.6778 | 0.5347 |
| 9 | 1 | 1 | 1 | 1.0000 | |
| 10 | 1 | 1 | 1 | 1.0000 | |
| 11 | 1 | 1 | 1 | 1.0000 | |
| 12 | 1 | 1 | 1 | 1.0000 | |
| 13 | 3 | 3 | 2.028662 | 0.6762 | 0.5962 |
| 14 | 1 | 1 | 1 | 1.0000 | |
| 15 | 1 | 1 | 1 | 1.0000 | |
| 16 | 1 | 1 | 1 | 1.0000 | |
| 17 | 1 | 1 | 1 | 1.0000 | |
| 18 | 1 | 1 | 1 | 1.0000 | |
| 19 | 1 | 1 | 1 | 1.0000 | |
| 20 | 1 | 1 | 1 | 1.0000 | |
| 21 | 1 | 1 | 1 | 1.0000 | |
| 22 | 1 | 1 | 1 | 1.0000 | |

**Total variation explained = 27.53216 Proportion = 0.8604**

## Oblique Principal Component Cluster Analysis

| 22 Clusters | | R-squared with | | |
|---|---|---|---|---|
| Cluster | Variable | Own Cluster | Next Closest | 1-R**2 Ratio |
| Cluster 1 | Age_at_Sale | 0.7430 | 0.3570 | 0.3996 |
| | Vinyl_Siding | 0.5484 | 0.2884 | 0.6346 |
| | Poured_Concrete | 0.6870 | 0.3900 | 0.5131 |
| | nbr_clus1 | 0.7229 | 0.3083 | 0.4006 |
| | nbr_clus2 | 0.6749 | 0.4049 | 0.5462 |
| Cluster 2 | Total_Bsmt_SF | 0.7767 | 0.1737 | 0.2702 |
| | Bsmt_Fin_SF | 0.7767 | 0.3213 | 0.3289 |
| Cluster 3 | Gr_Liv_Area | 0.7702 | 0.4010 | 0.3836 |
| | Bedroom_AbvGr | 0.7702 | 0.1480 | 0.2697 |
| Cluster 4 | Paved_Driveway | 1.0000 | 0.1239 | 0.0000 |
| Cluster 5 | Bsmt_Unf_SF | 1.0000 | 0.0548 | 0.0000 |
| Cluster 6 | CuldeSac | 1.0000 | 0.1141 | 0.0000 |
| Cluster 7 | Lot_Area | 1.0000 | 0.0692 | 0.0000 |
| Cluster 8 | fullbath_2plus | 0.7205 | 0.3903 | 0.4584 |
| | TwoPlusCar_Garage | 0.6485 | 0.2736 | 0.4839 |
| | AboveAverage_Quality | 0.6643 | 0.2440 | 0.4441 |
| Cluster 9 | Total_Functionality | 1.0000 | 0.0736 | 0.0000 |
| Cluster 10 | Normal_Prox_Cond | 1.0000 | 0.0224 | 0.0000 |
| Cluster 11 | nbr_clus3 | 1.0000 | 0.0056 | 0.0000 |
| Cluster 12 | AboveAverage_Condition | 1.0000 | 0.2742 | 0.0000 |
| Cluster 13 | High_Kitchen_Quality | 0.7197 | 0.3017 | 0.4014 |
| | High_Exterior_Qual | 0.7362 | 0.4097 | 0.4468 |
| | Excellent_Heat_QC | 0.5727 | 0.2364 | 0.5595 |
| Cluster 14 | Has_Fence | 1.0000 | 0.0655 | 0.0000 |
| Cluster 15 | fireplace_1plus | 1.0000 | 0.1707 | 0.0000 |
| Cluster 16 | Land_Level | 1.0000 | 0.0370 | 0.0000 |
| Cluster 17 | BelowAverage_Quality | 1.0000 | 0.1026 | 0.0000 |
| Cluster 18 | BelowAverage_Condition | 1.0000 | 0.0736 | 0.0000 |
| Cluster 19 | High_Exterior_Cond | 1.0000 | 0.0780 | 0.0000 |
| Cluster 20 | Irreq_Lot_Shape | 1.0000 | 0.1141 | 0.0000 |
| Cluster 21 | C_Air | 1.0000 | 0.1239 | 0.0000 |
| Cluster 22 | One_Floor | 1.0000 | 0.2159 | 0.0000 |

**Cluster 1 will be split because it has the largest second eigenvalue, 0.603022, which is greater than the MAXEIGEN=0.6 value.**

Clustering algorithm converged.

| Cluster Summary for 23 Clusters | | | | | |
|---|---|---|---|---|---|
| Cluster | Members | Cluster Variation | Variation Explained | Proportion Explained | Second Eigenvalue |
| 1 | 4 | 4 | 2.916174 | 0.7290 | 0.4423 |
| 2 | 2 | 2 | 1.55347 | 0.7767 | 0.4465 |
| 3 | 2 | 2 | 1.540439 | 0.7702 | 0.4596 |
| 4 | 1 | 1 | 1 | 1.0000 | |
| 5 | 1 | 1 | 1 | 1.0000 | |
| 6 | 1 | 1 | 1 | 1.0000 | |
| 7 | 1 | 1 | 1 | 1.0000 | |
| 8 | 3 | 3 | 2.033304 | 0.6778 | 0.5347 |

## Oblique Principal Component Cluster Analysis

| Cluster Summary for 23 Clusters | | | | | |
|---|---|---|---|---|---|
| Cluster | Members | Cluster Variation | Variation Explained | Proportion Explained | Second Eigenvalue |
| 9 | 1 | 1 | 1 | 1.0000 | |
| 10 | 1 | 1 | 1 | 1.0000 | |
| 11 | 1 | 1 | 1 | 1.0000 | |
| 12 | 1 | 1 | 1 | 1.0000 | |
| 13 | 3 | 3 | 2.028662 | 0.6762 | 0.5962 |
| 14 | 1 | 1 | 1 | 1.0000 | |
| 15 | 1 | 1 | 1 | 1.0000 | |
| 16 | 1 | 1 | 1 | 1.0000 | |
| 17 | 1 | 1 | 1 | 1.0000 | |
| 18 | 1 | 1 | 1 | 1.0000 | |
| 19 | 1 | 1 | 1 | 1.0000 | |
| 20 | 1 | 1 | 1 | 1.0000 | |
| 21 | 1 | 1 | 1 | 1.0000 | |
| 22 | 1 | 1 | 1 | 1.0000 | |
| 23 | 1 | 1 | 1 | 1.0000 | |

**Total variation explained = 28.07205 Proportion = 0.8773**

| 23 Clusters | | R-squared with | | |
|---|---|---|---|---|
| Cluster | Variable | Own Cluster | Next Closest | 1-R**2 Ratio |
| Cluster 1 | Age_at_Sale | 0.7614 | 0.3570 | 0.3711 |
| | Poured_Concrete | 0.6777 | 0.3900 | 0.5285 |
| | nbr_clus1 | 0.7434 | 0.3083 | 0.3710 |
| | nbr_clus2 | 0.7337 | 0.4049 | 0.4474 |
| Cluster 2 | Total_Bsmt_SF | 0.7767 | 0.1863 | 0.2744 |
| | Bsmt_Fin_SF | 0.7767 | 0.3213 | 0.3289 |
| Cluster 3 | Gr_Liv_Area | 0.7702 | 0.4010 | 0.3836 |
| | Bedroom_AbvGr | 0.7702 | 0.1480 | 0.2697 |
| Cluster 4 | Paved_Driveway | 1.0000 | 0.1239 | 0.0000 |
| Cluster 5 | Bsmt_Unf_SF | 1.0000 | 0.0548 | 0.0000 |
| Cluster 6 | CuldeSac | 1.0000 | 0.1141 | 0.0000 |
| Cluster 7 | Lot_Area | 1.0000 | 0.0692 | 0.0000 |
| Cluster 8 | fullbath_2plus | 0.7205 | 0.4003 | 0.4661 |
| | TwoPlusCar_Garage | 0.6485 | 0.2859 | 0.4922 |
| | AboveAverage_Quality | 0.6643 | 0.2536 | 0.4498 |
| Cluster 9 | Total_Functionality | 1.0000 | 0.0736 | 0.0000 |
| Cluster 10 | Normal_Prox_Cond | 1.0000 | 0.0240 | 0.0000 |
| Cluster 11 | nbr_clus3 | 1.0000 | 0.0056 | 0.0000 |
| Cluster 12 | AboveAverage_Condition | 1.0000 | 0.2718 | 0.0000 |
| Cluster 13 | High_Kitchen_Quality | 0.7197 | 0.2899 | 0.3947 |
| | High_Exterior_Qual | 0.7362 | 0.3951 | 0.4361 |
| | Excellent_Heat_QC | 0.5727 | 0.2110 | 0.5415 |
| Cluster 14 | Has_Fence | 1.0000 | 0.0600 | 0.0000 |
| Cluster 15 | fireplace_1plus | 1.0000 | 0.1707 | 0.0000 |
| Cluster 16 | Land_Level | 1.0000 | 0.0370 | 0.0000 |
| Cluster 17 | BelowAverage_Quality | 1.0000 | 0.1026 | 0.0000 |
| Cluster 18 | BelowAverage_Condition | 1.0000 | 0.0736 | 0.0000 |
| Cluster 19 | High_Exterior_Cond | 1.0000 | 0.0780 | 0.0000 |

## Oblique Principal Component Cluster Analysis

| 23 Clusters | | R-squared with | | |
|---|---|---|---|---|
| Cluster | Variable | Own Cluster | Next Closest | 1-R**2 Ratio |
| Cluster 20 | Irreq_Lot_Shape | 1.0000 | 0.1141 | 0.0000 |
| Cluster 21 | C_Air | 1.0000 | 0.1239 | 0.0000 |
| Cluster 22 | One_Floor | 1.0000 | 0.2159 | 0.0000 |
| Cluster 23 | Vinyl_Siding | 1.0000 | 0.3742 | 0.0000 |

**No cluster meets the criterion for splitting.**

| Number of Clusters | Total Variation Explained by Clusters | Proportion of Variation Explained by Clusters | Minimum Proportion Explained by a Cluster | Maximum Second Eigenvalue in a Cluster | Minimum R-squared for a Variable | Maximum 1-R**2 Ratio for a Variable |
|---|---|---|---|---|---|---|
| 1 | 7.665278 | 0.2395 | 0.2395 | 2.273223 | 0.0000 | |
| 2 | 9.318410 | 0.2912 | 0.2003 | 1.861523 | 0.0055 | 0.9946 |
| 3 | 10.782647 | 0.3370 | 0.2003 | 1.580090 | 0.0055 | 0.9990 |
| 4 | 12.144808 | 0.3795 | 0.2667 | 1.277230 | 0.0076 | 0.9970 |
| 5 | 13.201264 | 0.4125 | 0.2667 | 1.199255 | 0.0076 | 0.9970 |
| 6 | 14.336373 | 0.4480 | 0.3097 | 1.037528 | 0.0237 | 0.9807 |
| 7 | 15.334638 | 0.4792 | 0.3667 | 1.030320 | 0.0268 | 0.9792 |
| 8 | 16.188235 | 0.5059 | 0.3667 | 1.013512 | 0.0348 | 0.9712 |
| 9 | 17.171782 | 0.5366 | 0.3767 | 0.995020 | 0.0348 | 0.9712 |
| 10 | 18.144308 | 0.5670 | 0.3767 | 0.984173 | 0.0893 | 0.9149 |
| 11 | 19.127675 | 0.5977 | 0.3767 | 0.963315 | 0.2945 | 0.8158 |
| 12 | 20.055136 | 0.6267 | 0.5152 | 0.851749 | 0.3235 | 0.8158 |
| 13 | 20.846620 | 0.6515 | 0.5152 | 0.845288 | 0.3235 | 0.8158 |
| 14 | 21.691908 | 0.6779 | 0.5152 | 0.839398 | 0.3235 | 0.8158 |
| 15 | 22.525565 | 0.7039 | 0.5152 | 0.807658 | 0.4048 | 0.6632 |
| 16 | 23.333223 | 0.7292 | 0.5152 | 0.806703 | 0.4048 | 0.6632 |
| 17 | 24.139607 | 0.7544 | 0.6357 | 0.728683 | 0.5484 | 0.6346 |
| 18 | 24.868290 | 0.7771 | 0.6358 | 0.720631 | 0.5484 | 0.6346 |
| 19 | 25.588921 | 0.7997 | 0.6358 | 0.662151 | 0.5484 | 0.6346 |
| 20 | 26.251072 | 0.8203 | 0.6358 | 0.647995 | 0.5484 | 0.6346 |
| 21 | 26.899067 | 0.8406 | 0.6358 | 0.637553 | 0.5484 | 0.6346 |
| 22 | 27.532155 | 0.8604 | 0.6753 | 0.603022 | 0.5484 | 0.6346 |
| 23 | 28.072048 | 0.8773 | 0.6762 | 0.596157 | 0.5727 | 0.5415 |

**Oblique Principal Component Cluster Analysis**