Urban India Housing Condition Cluster: K-means and k-modes.

k-means:

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Cluster | ratio | Permanent Structure | Flush Latrine | Improved Latrine | Piped in Water | Pumped in Water | More Rooms | Separate Kitchen | Slum (%) | Cons (Rs.) | Renter (%) | Rent (Rs.) |
| 5 | 1.66 | 70.45 | 0 | 54.76 | 5.18 | 9.66 | 1.54 | 9.1 | 0.12 | 2300.00 | 0.26 | 1350 |
| 4 | 6.28 | 0 | 76.19 | 7.54 | 0 | 0 | 0 | 56.75 | 0.29 | 2500.00 | 0.36 | 1500 |
| 6 | 11.9 | 61.44 | 66.35 | 8.14 | 0 | 0 | 100 | 90.77 | 0.05 | 3000.00 | 0.17 | 3200 |
| 3 | 16.68 | 71.93 | 79.11 | 4.02 | 0 | 100 | 61.55 | 76.66 | 0.03 | 3062.50 | 0.24 | 2000 |
| 2 | 29.8 | 88.78 | 94.43 | 0 | 68.39 | 0 | 0 | 66.62 | 0.09 | 3528.00 | 0.51 | 2400 |
| 1 | 33.68 | 79.18 | 84.14 | 1.97 | 93.64 | 0 | 91.12 | 87.23 | 0.04 | 3866.75 | 0.22 | 4000 |

k-modes:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| cluster | ratio | in\_all\_permanent | in\_sep\_kitch | in\_flat | in\_room\_grp | h20 | san | Rent (Rs.) | Cons (Rs.) | Household Size | Slum (%) | Ownership (%) | P/R |
| 3 | 21.17 | No | Yes | No | 4 | Yard | Flush | 1325 | 2600.00 | 3 | 15.77 | 41.2 | 1.5 |
| 1 | 32.41 | Yes | Yes | No | >6 | Piped in | Flush | 1600 | 2616.67 | 4 | 14.28 | 70.32 | 1 |
| 5 | 8.23 | Yes | Yes | No | 5 | Pump in | Flush | 3000 | 2900.00 | 4 | 2.85 | 83.62 | 1 |
| 6 | 12.66 | Yes | No | No | 2 | Pump out | Flush | 1600 | 2966.67 | 4 | 11.95 | 43.8 | 1.3 |
| 2 | 18.6 | Yes | Yes | Yes | 4 | Piped in | Flush | 3000 | 3375.00 | 4 | 2.74 | 83.16 | 0.8 |
| 4 | 6.92 | Yes | No | No | 3 | Piped in | Flush | 3500 | 4194.50 | 4 | 3.49 | 44.75 | 0.8 |

Summary:

[[1]]

Permanent Structure Separate Kitchen Flat Number of Rooms Water Access Sanitation Access House Age cluster

No :7544 No :1355 No :8672 >6: 382 Other : 630 Flush :6203 <= 5 yrs : 483 Min. :1

Yes:1576 Yes:7765 Yes: 448 1 : 609 Piped in:1860 Improved Pit : 919 5 to 10 yrs :1378 1st Qu.:1

2 :1273 Pump in :1390 Other : 715 10 to 20 yrs:1991 Median :1

3 :2113 Pump out:1541 Single/Twin Pit:1283 20 to 40 yrs:1852 Mean :1

4 :2703 Yard :3699 > 40 yrs : 869 3rd Qu.:1

5 :1097 NA's :2547 Max. :1

6 : 943

[[2]]

Permanent Structure Separate Kitchen Flat Number of Rooms Water Access Sanitation Access House Age cluster

No : 393 No : 53 No :13286 >6:5378 Other : 648 Flush :12266 <= 5 yrs :1022 Min. :2

Yes:13567 Yes:13907 Yes: 674 1 : 6 Piped in:11407 Improved Pit : 187 5 to 10 yrs :2765 1st Qu.:2

2 : 463 Pump in : 1154 Other : 212 10 to 20 yrs:3678 Median :2

3 :1615 Pump out: 493 Single/Twin Pit: 1295 20 to 40 yrs:2826 Mean :2

4 :2184 Yard : 258 > 40 yrs :1247 3rd Qu.:2

5 :2410 NA's :2422 Max. :2

6 :1904

[[3]]

Permanent Structure Separate Kitchen Flat Number of Rooms Water Access Sanitation Access House Age cluster

No :1947 No :5328 No :4203 >6: 8 Other : 88 Flush :3769 <= 5 yrs : 214 Min. :3

Yes:3507 Yes: 126 Yes:1251 1 :1640 Piped in:1163 Improved Pit : 245 5 to 10 yrs : 505 1st Qu.:3

2 :3163 Pump in : 914 Other : 930 10 to 20 yrs: 692 Median :3

3 : 544 Pump out:2258 Single/Twin Pit: 510 20 to 40 yrs: 718 Mean :3

4 : 57 Yard :1031 > 40 yrs : 401 3rd Qu.:3

5 : 24 NA's :2924 Max. :3

6 : 18

[[4]]

Permanent Structure Separate Kitchen Flat Number of Rooms Water Access Sanitation Access House Age cluster

No : 345 No : 364 No : 0 >6: 0 Other : 59 Flush :7774 <= 5 yrs : 270 Min. :4

Yes:7667 Yes:7648 Yes:8012 1 : 196 Piped in:6123 Improved Pit : 43 5 to 10 yrs : 933 1st Qu.:4

2 : 456 Pump in : 457 Other : 44 10 to 20 yrs:1051 Median :4

3 :1545 Pump out: 246 Single/Twin Pit: 151 20 to 40 yrs: 876 Mean :4

4 :2410 Yard :1127 > 40 yrs : 389 3rd Qu.:4

5 :2100 NA's :4493 Max. :4

6 :1305

[[5]]

Permanent Structure Separate Kitchen Flat Number of Rooms Water Access Sanitation Access House Age cluster

No : 256 No : 24 No :3387 >6: 0 Other : 71 Flush :3009 <= 5 yrs :299 Min. :5

Yes:3288 Yes:3520 Yes: 157 1 : 5 Piped in: 0 Improved Pit : 104 5 to 10 yrs :750 1st Qu.:5

2 : 136 Pump in :2773 Other : 80 10 to 20 yrs:936 Median :5

3 : 349 Pump out: 265 Single/Twin Pit: 351 20 to 40 yrs:730 Mean :5

4 : 627 Yard : 435 > 40 yrs :255 3rd Qu.:5

5 :1897 NA's :574 Max. :5

6 : 530

[[6]]

Permanent Structure Separate Kitchen Flat Number of Rooms Water Access Sanitation Access House Age cluster

No : 884 No :2982 No :2255 >6: 0 Other : 57 Flush :2452 <= 5 yrs : 105 Min. :6

Yes:2098 Yes: 0 Yes: 727 1 : 570 Piped in:1848 Improved Pit : 89 5 to 10 yrs : 305 1st Qu.:6

2 : 0 Pump in : 567 Other : 202 10 to 20 yrs: 410 Median :6

3 :2199 Pump out: 0 Single/Twin Pit: 239 20 to 40 yrs: 401 Mean :6

4 : 71 Yard : 510 > 40 yrs : 243 3rd Qu.:6

5 : 104 NA's :1518 Max. :6

6 : 38

K-means and k-modes compare:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
| Housing condition (cluster) | Con. (k-means) | Con. (k-modes) | Rent (k-means) | Rent (K-modes) |
| 1 | 2300.00 | 2600.00 | 1350 | 1325 |
| 2 | 2500.00 | 2616.67 | 1500 | 1600 |
| 3 | 3000.00 | 2900.00 | 3200 | 3000 |
| 4 | 3062.50 | 2966.67 | 2000 | 1600 |
| 5 | 3528.00 | 3375.00 | 2400 | 3000 |
| 6 | 3866.75 | 4194.50 | 4000 | 3500 |