**Performance using different clustering techniques on various parameters**

| Parameters | No Data Processing | | | Using Normalization | | | Using Transform | | | Using PCA | | | Using T+N | | | T+N+PCA | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | c=3 | c=4 | c=5 | c=3 | c=4 | c=5 | c=3 | c=4 | c=5 | c=3 | c=4 | c=5 | c=3 | c=4 | c=5 | c=3 | c=4 | c=5 |
| Silhouette | 0.5711 | 0.5578 | 0.5169 | 0.5479 | 0.5577 | 0.5489 | 0.5711 | 0.5587 | 0.5175 | 0.5711 | 0.5669 | 0.5640 | 0.5711 | 0.5573 | 0.5239 | 0.5711 | 0.5587 | 0.5489 |
| Calinski-Harabasz | 561.81 | 704.92 | 710.01 | 498.86 | 702.20 | 787.04 | 561.81 | 702.67 | 686.93 | 561.81 | 696.83 | 703.27 | 561.81 | 595.80 | 689.79 | 561.81 | 702.67 | 787.04 |
| Davies-Bouldin | 0.5342 | 0.5441 | 0.5542 | 0.5531 | 0.5453 | 0.5450 | 0.5342 | 0.5460 | 0.5306 | 0.5342 | 0.5486 | 0.4834 | 0.5342 | 0.5026 | 0.5174 | 0.5342 | 0.5460 | 0.5450 |

Table 1: Using K-Means Clustering

| Parameters | No Data Processing | | | Using Normalization | | | Using Transform | | | Using PCA | | | Using T+N | | | T+N+PCA | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | c=3 | c=4 | c=5 | c=3 | c=4 | c=5 | c=3 | c=4 | c=5 | c=3 | c=4 | c=5 | c=3 | c=4 | c=5 | c=3 | c=4 | c=5 |
| Silhouette | 0.5645 | 0.5607 | 0.5075 | 0.5645 | 0.5607 | 0.5075 | 0.5645 | 0.5607 | 0.5075 | 0.5645 | 0.5607 | 0.5075 | 0.5645 | 0.5607 | 0.5075 | 0.5645 | 0.5607 | 0.5075 |
| Calinski-Harabasz | 552.85 | 670.63 | 684.22 | 552.85 | 670.63 | 684.22 | 552.85 | 670.63 | 684.22 | 552.85 | 670.63 | 684.22 | 552.85 | 670.63 | 684.22 | 552.85 | 670.63 | 684.22 |
| Davies-Bouldin | 0.5357 | 0.5536 | 0.5513 | 0.5357 | 0.5536 | 0.5513 | 0.5357 | 0.5536 | 0.5513 | 0.5357 | 0.5536 | 0.5513 | 0.5357 | 0.5536 | 0.5513 | 0.5357 | 0.5536 | 0.5513 |

Table 2: Using Agglomerative Clustering

| Parameters | No Data Processing | | | Using Normalization | | | Using Transform | | | Using PCA | | | Using T+N | | | T+N+PCA | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | c=3 | c=4 | c=5 | c=3 | c=4 | c=5 | c=3 | c=4 | c=5 | c=3 | c=4 | c=5 | c=3 | c=4 | c=5 | c=3 | c=4 | c=5 |
| Silhouette | 0.5645 | 0.5607 | 0.5075 | 0.5645 | 0.5607 | 0.5075 | 0.5645 | 0.5607 | 0.5075 | 0.5645 | 0.5607 | 0.5075 | 0.5645 | 0.5607 | 0.5075 | 0.5645 | 0.5607 | 0.5075 |
| Calinski-Harabasz | 552.85 | 670.63 | 684.22 | 552.85 | 670.63 | 684.22 | 552.85 | 670.63 | 684.22 | 552.85 | 670.63 | 684.22 | 552.85 | 670.63 | 684.22 | 552.85 | 670.63 | 684.22 |
| Davies-Bouldin | 0.5357 | 0.5536 | 0.5513 | 0.5357 | 0.5536 | 0.5513 | 0.5357 | 0.5536 | 0.5513 | 0.5357 | 0.5536 | 0.5513 | 0.5357 | 0.5536 | 0.5513 | 0.5357 | 0.5536 | 0.5513 |

Table 3: Using Birch Clustering

| Parameters | No Data Processing | | | Using Normalization | | | Using Transform | | | Using PCA | | | Using T+N | | | T+N+PCA | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | c=3 | c=4 | c=5 | c=3 | c=4 | c=5 | c=3 | c=4 | c=5 | c=3 | c=4 | c=5 | c=3 | c=4 | c=5 | c=3 | c=4 | c=5 |
| Silhouette | 0.2803 | 0.2803 | 0.2803 | 0.2803 | 0.2803 | 0.2803 | 0.2803 | 0.2803 | 0.2803 | 0.2803 | 0.2803 | 0.2803 | 0.2803 | 0.2803 | 0.2803 | 0.2803 | 0.2803 | 0.2803 |
| Calinski-Harabasz | 3.37 | 3.37 | 3.37 | 3.37 | 3.37 | 3.37 | 3.37 | 3.37 | 3.37 | 3.37 | 3.37 | 3.37 | 3.37 | 3.37 | 3.37 | 3.37 | 3.37 | 3.37 |
| Davies-Bouldin | 0.4477 | 0.4477 | 0.4477 | 0.4477 | 0.4477 | 0.4477 | 0.4477 | 0.4477 | 0.4477 | 0.4477 | 0.4477 | 0.4477 | 0.4477 | 0.4477 | 0.4477 | 0.4477 | 0.4477 | 0.4477 |

Table 4: Using Spectral Clustering

*The reason why the values in* ***BIRCH clustering*** *and* ***Agglomerative Clustering*** *are the same becaues they both are hierarchical in nature. Some other reaons may include usage of same distance metrics, number of clusters and preprocessing techniques.*

[0]T : Transformation N : Normalization PCA : Principal Component Analysis