Quantitative measurement of PCA and t-SNE

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|  | GSE69405 | GSE73121 | GSE81608 | GSE83139 |
| PCA | 0.28 | 1.67 | 4.75 | 6.79 |
| t-SNE | 0.20 | 0.90 | 1.44 | 4.11 |

Here we used Davies-Bouldin index (DBI) to measure the performance of PCA and t-SNE, which is calculated as



where the *N* points (or cells) *X*1, *X*2 … *XN* are classified into *M* groups Ω1, Ω2 … Ω*M*, and the centroid of each group is *A*1, *A*2 … *AM* respectively, |Ω*i*| represents the number of points in Ω*i*, ||·|| represents Euclidean distance. **As DBI is defined as the ratio of the within cluster scatter to the between cluster separation, lower value of DBI means that the clustering is better.**