Normalization

Samples

Genes

Normalize expression values of each gene across samples to 0 (Min) ~ 1 (Max)

Computation of mean and standard deviation

For gene \(i\), let the mean and standard deviation of the gene expression values in class \(j\) be \(\mu_{ij}, \sigma_{ij}\)

Sorting of the mean values

Let \(\mu_{1(s)}, \mu_{2(s)}, \mu_{3(s)} \ldots \mu_{k(s)}\) be the sorted mean values in descending order

For gene \(i\), the associated mean values

the associated class label

Computation of GDI for dominant genes

\[
GDI_{Dom} = \frac{\mu_{1(s)} - \mu_{2(s)}}{\sigma_{1(s)} + \sigma_{2(s)}}
\]

Computation of GDI for dormant genes

\[
GDI_{Dor} = \frac{\mu_{k-1(s)} - \mu_{k(s)}}{\sigma_{k-1(s)} + \sigma_{k(s)}}
\]

Finding a list of dominant/dormant genes for each class

Sort genes in descending order according to the GDI values

Class 1 | Class 2 | Class 3 | Class k
---|---|---|---
GDI\(_{1,1}\) | GDI\(_{2,1}\) | GDI\(_{3,1}\) | \(\ldots\)
GDI\(_{1,2}\) | GDI\(_{2,2}\) | GDI\(_{3,2}\) | \(\ldots\)
\(\ldots\) | \(\ldots\) | GDI\(_{3,n3}\) | \(\ldots\)
\(\ldots\) | \(\ldots\) | \(\ldots\) | \(\ldots\)
GDI\(_{1,n1}\) | \(\ldots\) | \(\ldots\) | GDI\(_{k,nk}\)

Top1 set

Top2 set

Top3 set