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Qlucore Omics Explorer calculation benchmarks

Qlucore Omics Explorer is much faster than other bioinformatic software solutions. Below are two benchmarks presented. They are static comparisons. In real life data analysis, the difference is even greater since changes to for instance filter levels which changes the input requires full recalculation in R where Qlucore Omics Explorer (QOE) only will recalculate as little as possible. Hence, the dynamic behavior of QOE will be many times faster than the already impressive static performance.

STATIC PCA CALCULATIONS:
30k features and 150 samples.

Set-up in R:

```
X = matrix(rnorm(30000*150),30000)

df = as.data.frame(X)

system.time({ F = prcomp(df, scale=TRUE, rank=3) })
```

The same calculation in Qlucore is **77 times faster.**

STATIC T-SNE CALCULATIONS
30k features and 150 samples.

Set-up in R:

```
X = matrix(rnorm(30000*150),150)

system.time({ T = Rtsne(X, dims=2, pca_scale = TRUE, perplexity = 30, exaggeration_factor = 1) })
```

The same calculation in Qlucore is **13 times faster.**

BACKGROUND
The tests are run on the same computer. Qlucore Omics Explorer version 3.6

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STATISTIC TEST – KRUSKAL-WALLIS:
Performance comparison: Comparing the new Multi group native implementation of Kruskal Wallis against the equivalent R-Script version from QOE 3.8. The tests were performed given the following setup:

Using "Acute Lymphoblastic Leukemia" dataset with the test applied to sample annotation "Leukemia Subtype". Tests performed on a computer equipped with Intel i9-9900X CPU with 48GB of system memory and 1TB Samsung EVO 970 SSD. An average of 3 executions for each test setup was measured.

New native version: The measuring of time was restricted to measuring the time of the method in the software that performs the actual calculation.

R-script version from QOE 3.8: The kruskal_wallis.R script was modified to enable for time measuring.

Result: The average time for the new native Kruskal Wallis calculation = 0.039s. The average time for R-Script Kruskal Wallis calculation = 35.025s. 35.025/0.039 = 898 times faster.