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Analysis in an instant

OMICs data analysis in Qlucore: Plots in focus

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Training, Application Support

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Visualize and Explore

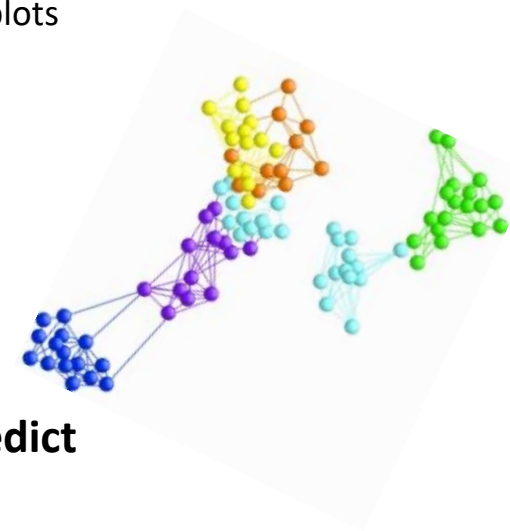
- QC (outliers, mislabeled samples)
- Make observations - identify structures, patterns
- Generate new hypotheses
- Browse the genome

Analysis

- t-test, ANOVA, Regressions, R scripts. Open API to R, Batch exec
- Variant calling
- Easy generation and export of reports, status, and plots
- Save your session, share

Biological Insight

- GSEA using MSigDB, reactome, or custom gene sets
- GO Browser
- GO enrichment
- NDEx



AI - Classify and Predict

- Build classifiers
- kNN, SVM, RT
- Predict sample class, outcome, etc.

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Enjoy fantastic computing speed on a laptop to boost your discovery and scientific creativity

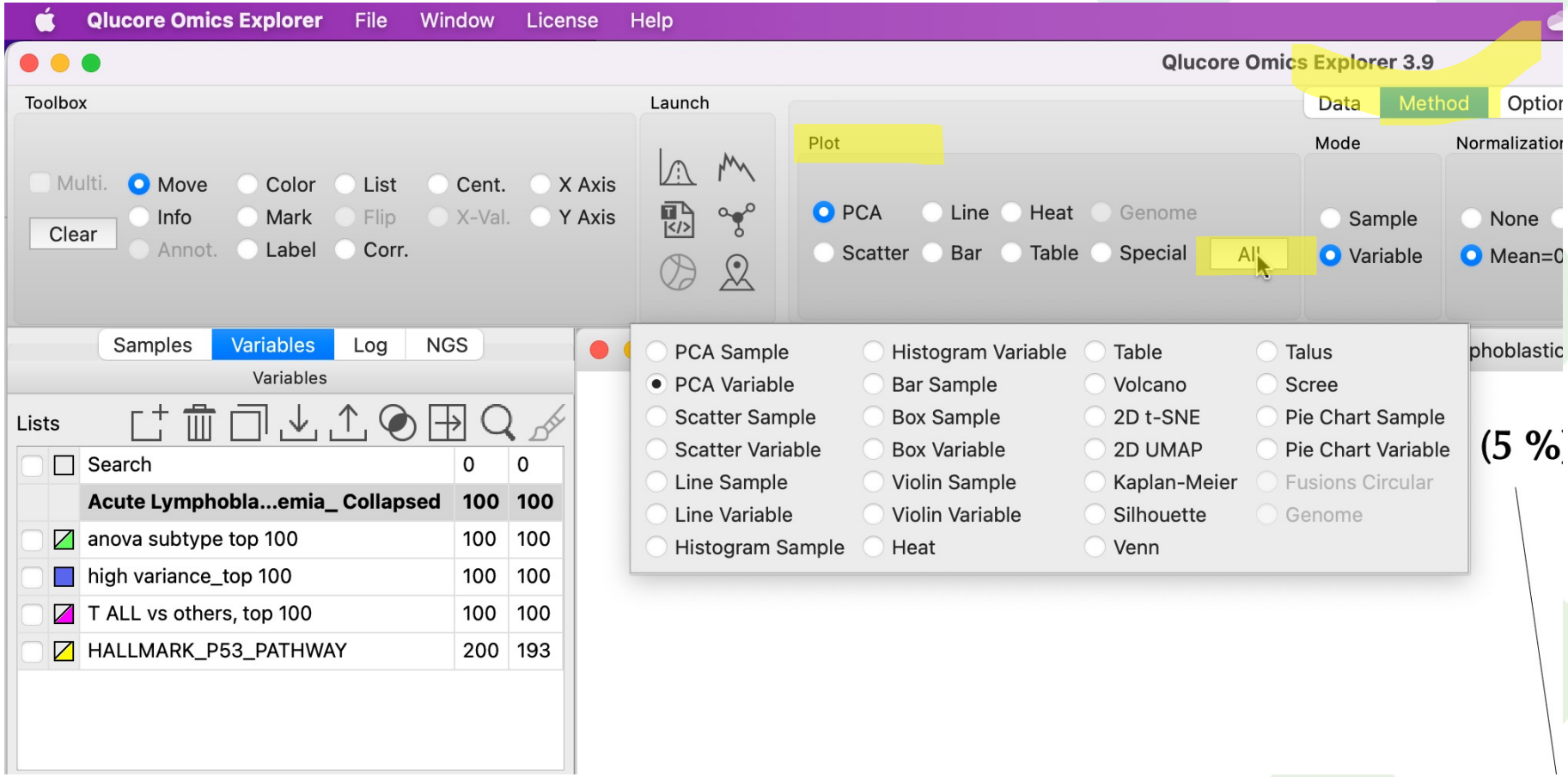
Benchmark examples (static). Compared to R	Times faster
ANOVA (22k var. + 130 samples)	2800
t-test (two-groups, selected from 22k var. + 130 samples)	1000
Kruskal-Wallis (22k var. + 130 samples)	900
Mann-Whitney U-test (two groups, 30k var. + 5k samples)	480
ANOVA (30k var. + 5000 samples)	180
PCA calculations (30k var. + 150 samples)	77
UMAP (22k var. + 130 samples)	13

The speed enables a more flexible workflow – generating better results faster.

Details at: https://qlucore.com/calculation-benchmarks

"This tool might literally save you years of your life"
Prof. Ulrich Steidl at Albert Einstein College of Medicine

Plot options



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Venn Diagram

John Venn introduced it in an 1880 paper entitled:

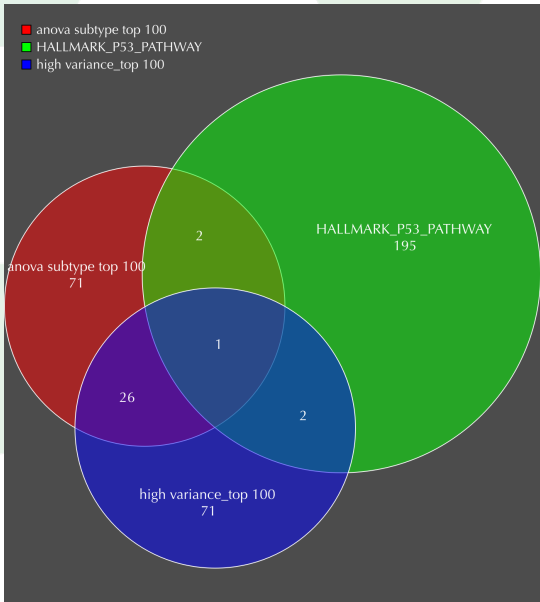
"On the Diagrammatic and Mechanical Representation of Propositions and Reasonings"

Math: Venn diagrams are used for **sets, intersections, and unions**

Statistics and probability: Venn diagrams are used to express the **relationships between two or more data sets** in an easily understood way – efficient connections between things

Simple + Powerful, especially:

- to highlight similarities and differences, and
- to compare and contrast the characteristics of different sets.



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When?

- Venn's initial rationale for it: "Some of X is Y and some of Y is X."

If *this* is what you're trying to communicate, then Venn.

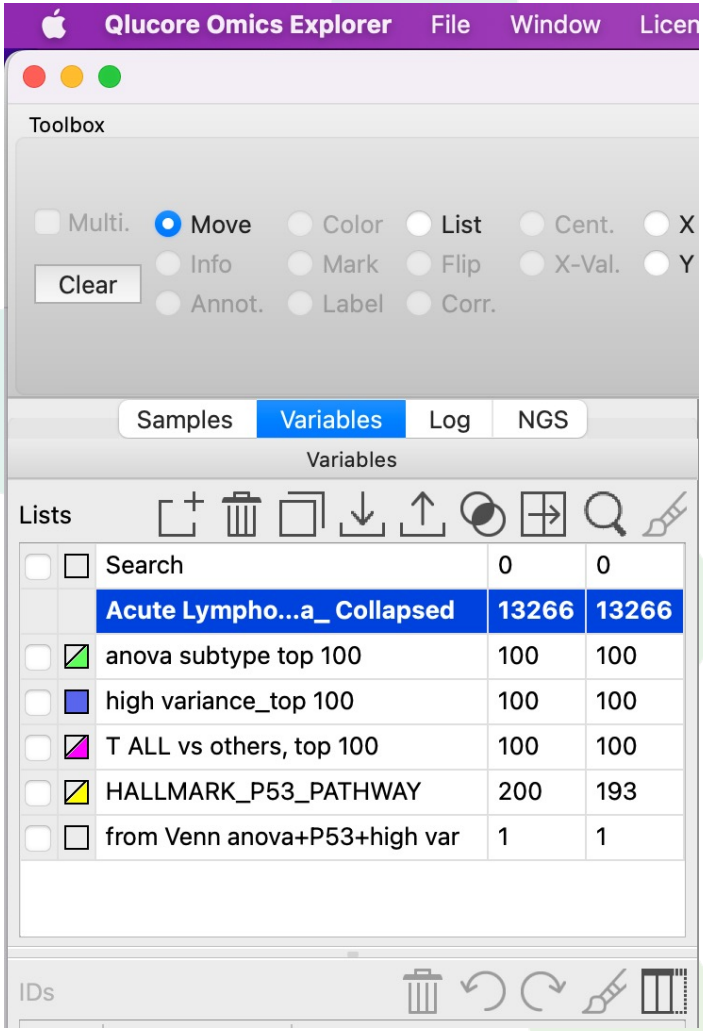
- "These sets have more (or less) in common than you might think."
- "We're talking about a *very specific* subset."

Examples of Sets/Lists

1. **Whole data sets**

2. **Data subsets**:

- Statistically significant results
- Variance-based lists
- Pathways, GO lists
- Any lists



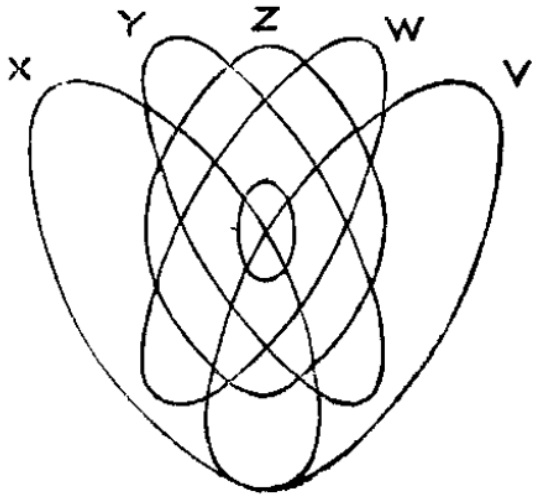
Venn Diagram

How many sets (terms, gene lists, data sets/subsets) can be used?

See example with 5 sets/terms below (original paper)

Y and W, but are no part of Z).

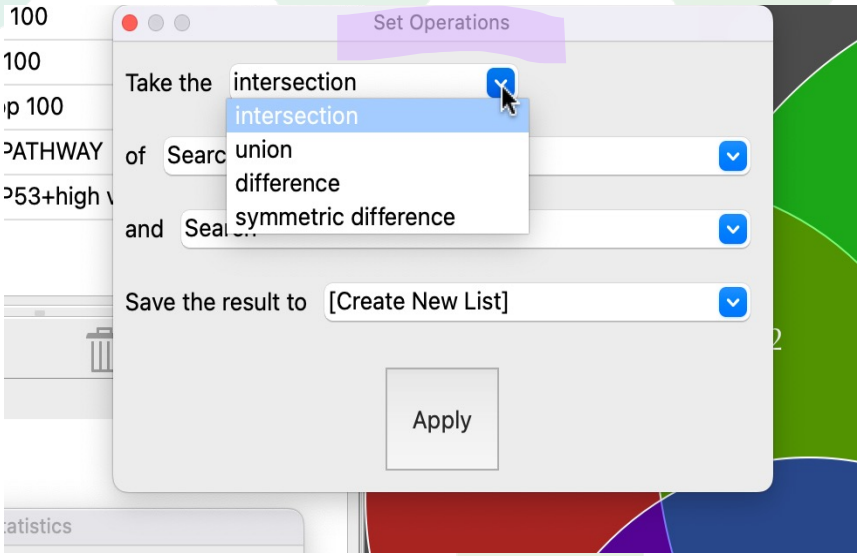
It must be admitted that such a diagram is not quite so simple to draw as one might wish it to be; but then we must remember what are the alternatives before any one who wishes to grapple effectively with five terms and all the thirty-two possibilities which they yield. He must either write down or in some



Handling sets two at a time?

Yes! Not visual, manual, tedious, more operator error prone:

- **Intersection** of A and B
- **Difference** A vs B (unique to A)
- **Symmetric Difference** (unique to A and B merged)
- **Merge sets** without duplicates



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What makes the Qlucore software unique?

- Instant visual feedback
- Easy: to learn – to use – to remember how to use
- Automated access to public data as GEO, TCGA
- Easy import of other public data in a matrix format – like GREIN
- Share analyses, save your sessions to resume later ☺

Pie Chart – part-to-whole relationship in your data

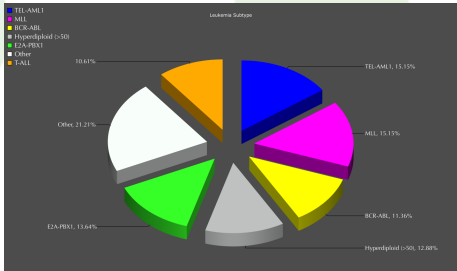
- Displays **relative proportions** of multiple classes of data (%, frequency).
- Size of the circle can be made **proportional** to the total quantity it represents. Hence, can serve as a visual QC check of calculation accuracy.
- Summarizes a **large data set in visual form** – overview of classes.
- Visually simpler than other types of graphs.

1st known Pie – 1801 Scottish writer on political economy William Playfair (1759-1823), known as the inventor of statistical graphs.

"Making an appeal to the eye when proportion and magnitude are concerned, is the best and readiest method of conveying a distinct idea"

The pie chart and bar chart were described.

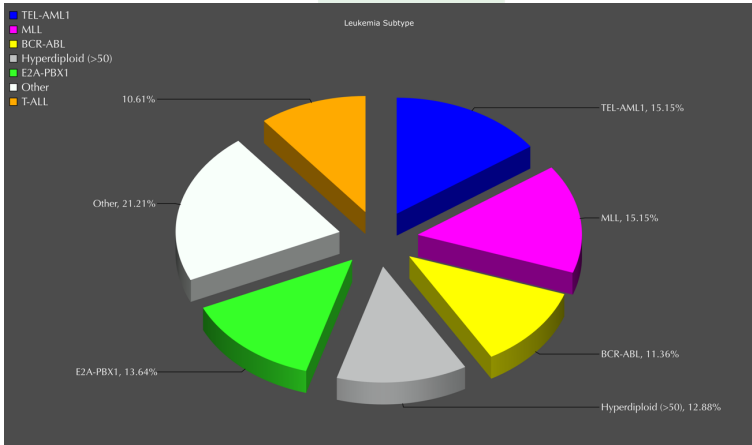
Some believe that he also invented the line plot



Pie Chart – part-to-whole relationship in your data

Keep in mind:

- **Too similar slices** (unless you need to show that, but really no need in a plot). Simple bar plot is better then.
- **Exploded plot may distort proportions**, but helps with many slices.
- **Too many** slices.
- Use of **color**.



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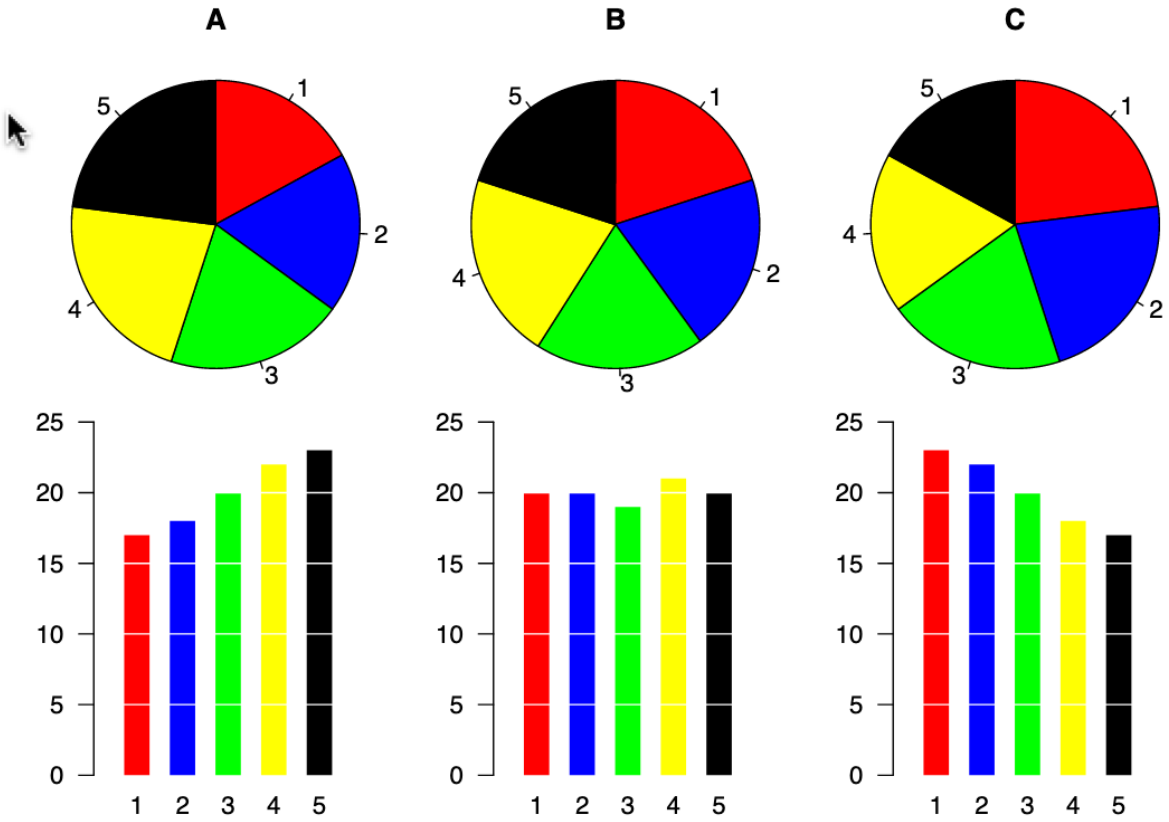
Pie vs Histogram
“evil pie”



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DEMO

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Next steps
Experience your data in depth:

1. Join free fully supported trial -- download and install the trial version (Mac or Win version - links), and then update the license key in **Qlucore – License – Activation Key** with the key from us

2. Book a session with us – get help setting up your analysis.
https://calendly.com/yana-stackpole/30min

3. Link to join our Discord channel with instructional videos and 30 min webinars:
https://discord.gg/zu8h8FJx

Reach out any time Yana.Stackpole@Qlucore.com

System requirements
Base module

FOR WINDOWS

- Windows 7, Windows 8 or Windows 10
- 512 MB of RAM memory
- A graphical card with support of at least Open GL 2.1
- 5 GB of free hard disk space
- The program takes full advantage of processors with multiple cores and computers with multiple processors.

FOR MAC

- Max OS X 10.15 or 10.14
- 512 MB of RAM memory
- A graphical card with support of at least Open GL 2.1
- 5 GB of free hard disk space