

TikZ graphics

Deependra Dhakal

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1 Beginning

This document has a two fold purpose – one, familiarize yourself with tikz while learning it from basics and second, ease your life with handful of tricks and packages that do drawing jobs for you. Most of the ideas are not original and picked up from tex.stackexchange.com. I will link to the online contents as we go along with demonstration. Before anything new, try this very hot manual for pgf at <https://www.iro.umontreal.ca/~simardr/pgfmanual.pdf>. Its 560 pages full of fun and awesomeness. I think there is barely anything it misses.

One of my first tikz picture included creating just a triangle by specifying coordinates. Like the one in Figure 1.

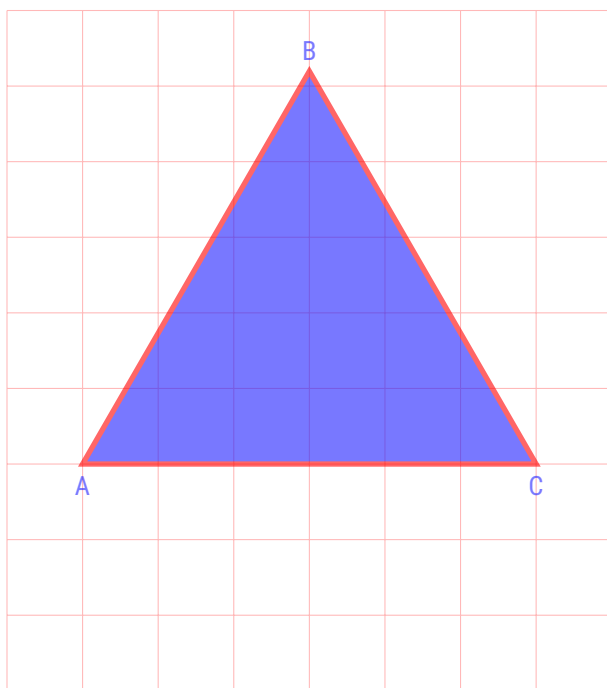


Figure 1: An equilateral triangle

1.1 More basic shapes

A basic rectangle geometry is already defined in TikZ. Just input the starting and ending coordinates.



Next up, we could make potting so much easier is several ways. The same triangle has been bettered in Figure 2. Notably, we remove the grid, add dotted segments and improve labelling of nodes by aligning them.

More on this basic shapes and segments in Section 1.8.

Note: Tufte/tint by default does not support section numbering and thus not let reference section. We need to fix it by setting 'number_sections: true' in yaml.

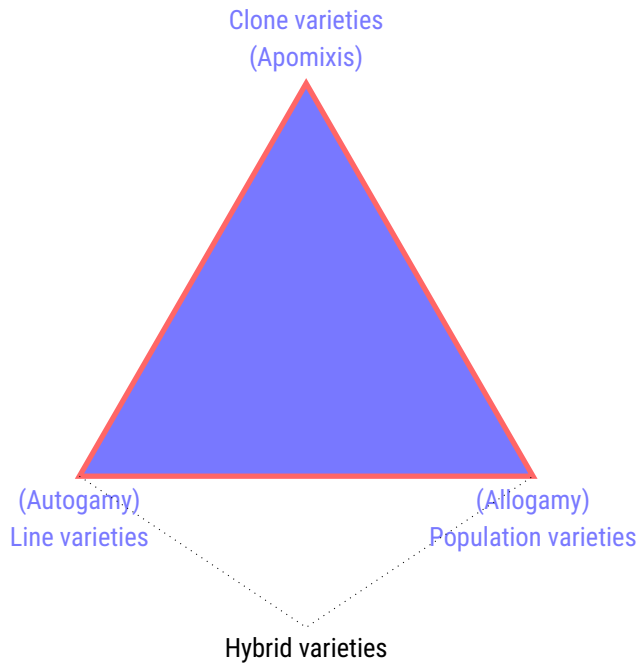


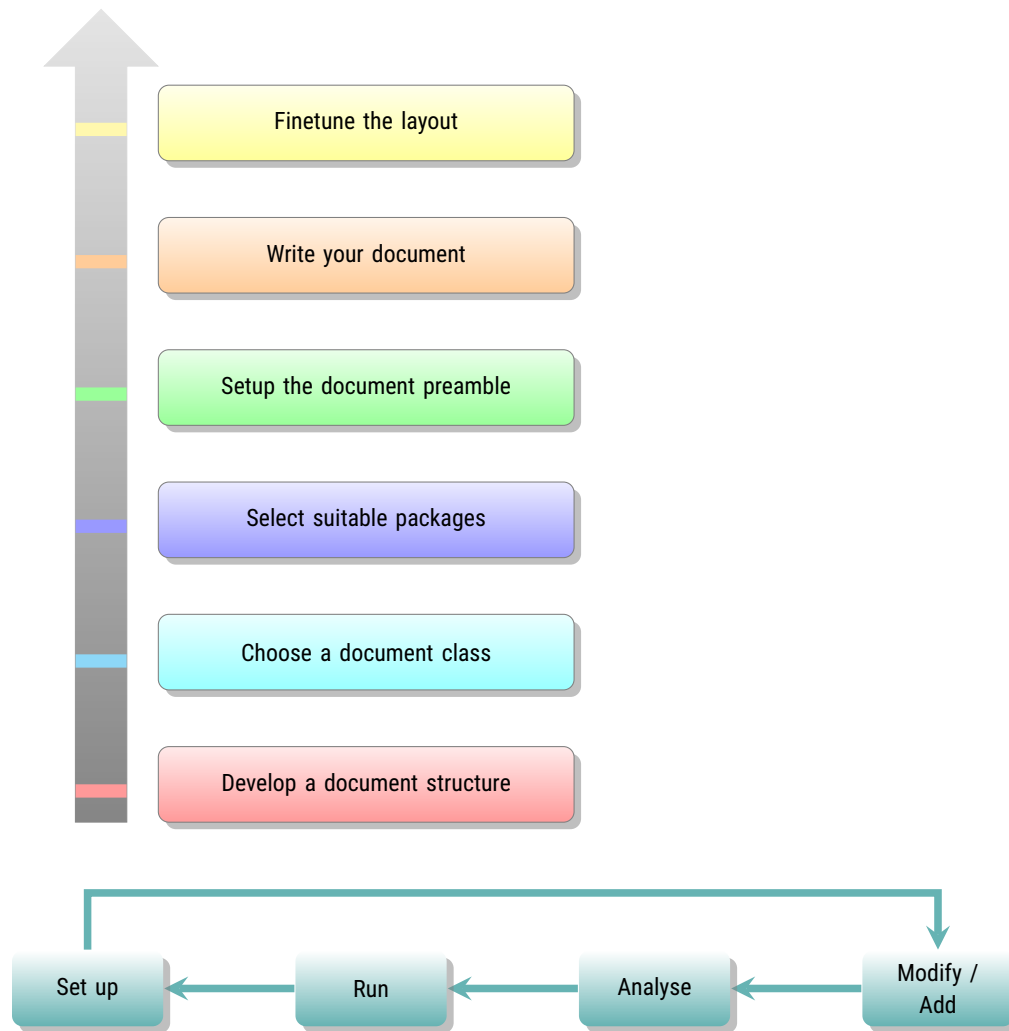
Figure 2: The reproduction triangle with the modes of reproduction (in bracketted letters) and the four breeding categories and resulting types of varieties. The system also implies that there are not strict barriers between reproductive systems, but a gradual transition from one mode to the neighboring one. Clonal varieties can be selected for strictly apomictic plants. While autogamy and allogamy are not as strict in plant kingdom as even highly autogamous lines may cross fertilize nearby plants. Hybrid breeding, as shown involves both autogamy and allogamy and could be called a man-made breeding system.

1.2 Using intersection features

Using name path requires intersections tikzlibrary

1.3 Smartdiagram template

But more suited to instant presentation without much hassles. A full pdf documentation for the Claudio Fiandrino's package is available at <http://texdoc.net/texmf-dist/doc/latex/smartdiagram/smartdiagram.pdf>. It seems super useful to draw flow diagrams, instantly, alike mermaidjs graphics. More popular drawing types are: descriptive diagram, priority descriptive diagram, constellation diagram, sequence diagram, flow diagram, circular diagram, etc.



1.4 Using chains and flows

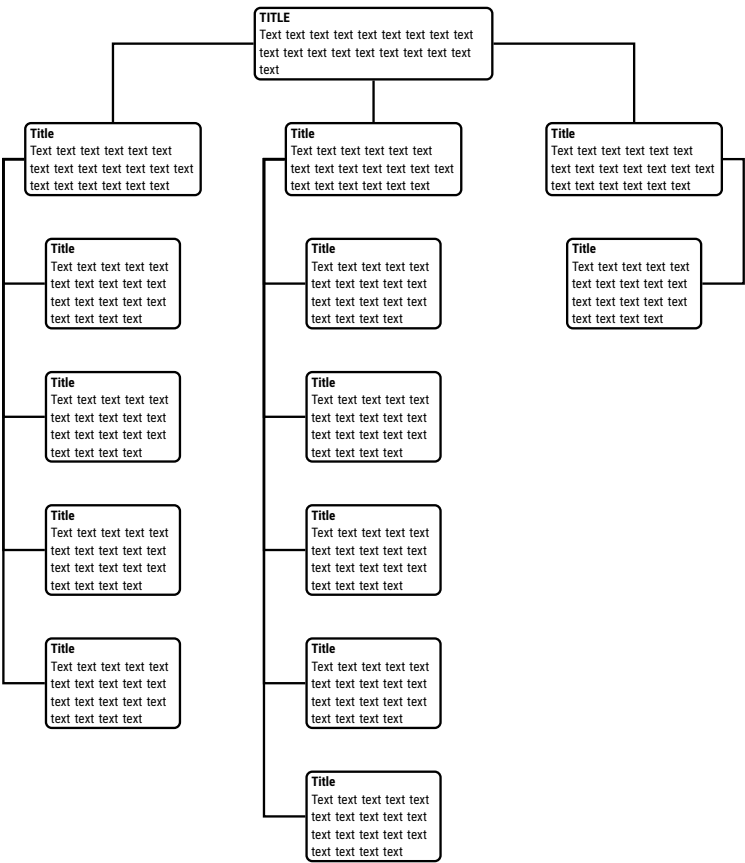


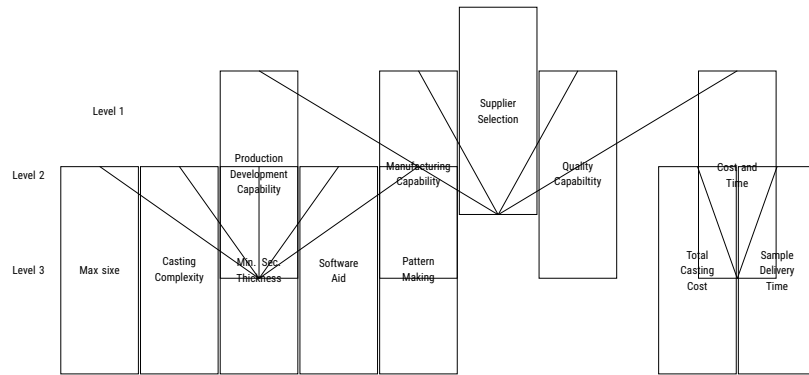
Figure 3: This figure uses chains tikzlibrary and in addition, can be simplified a bit using paths.ortho tikzlibrary. The latter library is not available by default and is detailed at <https://tex.stackexchange.com/a/121121/133229>

. Notice how enclosing the picture in resizebox places it correctly within the bounds of textwidth. .

Use of flow and chain diagrams is easily apparent¹. ¹ Figure 3 can be heavily customized

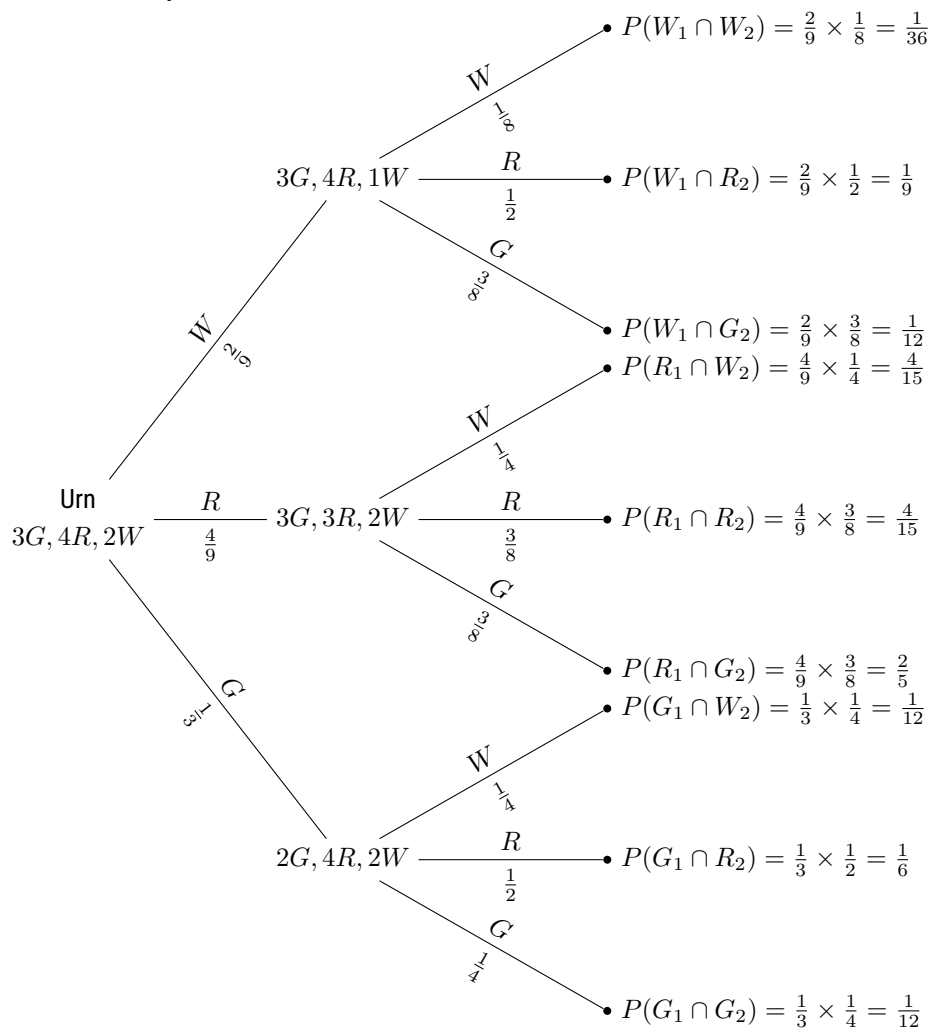
1.5 TikZ tree diagram

This diagram is drawn from <https://tex.stackexchange.com/a/161263/133229>. As an alternative to tikz library trees, forest package is also suggested. But we stick to the basics and add the trees tikzlibrary to the header.



1.6 Drawing probability trees

Probability trees can be drawn using both the forest package and usign `\usetikzlibrary{trees}`.



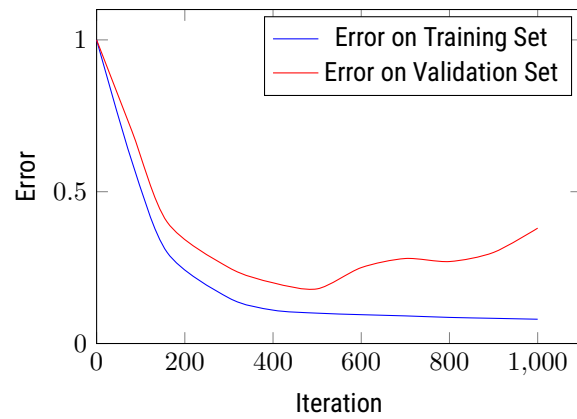


Figure 4: The error on the validation set (red) is usually getting larger when the network begins to overfit the training set. Thus, although the error on the training set (blue) is decreasing monotonically, we may want to stop training early to avoid overfitting.

1.7 Side caption plot (uses sidecap package)

1.8 Shapes and segments