Examples: Version 5.2

This is a collection of diagrams the author has had occasion to produce using m4 circuit macros and others, and gpic or dpic. In some cases, there are other or better m4 or pic constructs for producing the same drawings, but for reference the names of the source files are shown. Most of the examples can be processed using either dpic -p or gpic -t, which has meant that in a few cases the source is slightly more complicated than it would be if only one processor had been assumed.

For some more examples in the context of a textbook, see J. Dwight Aplevich, *The Essentials of Linear State-Space Systems*, New York, John Wiley & Sons Inc., 2000.

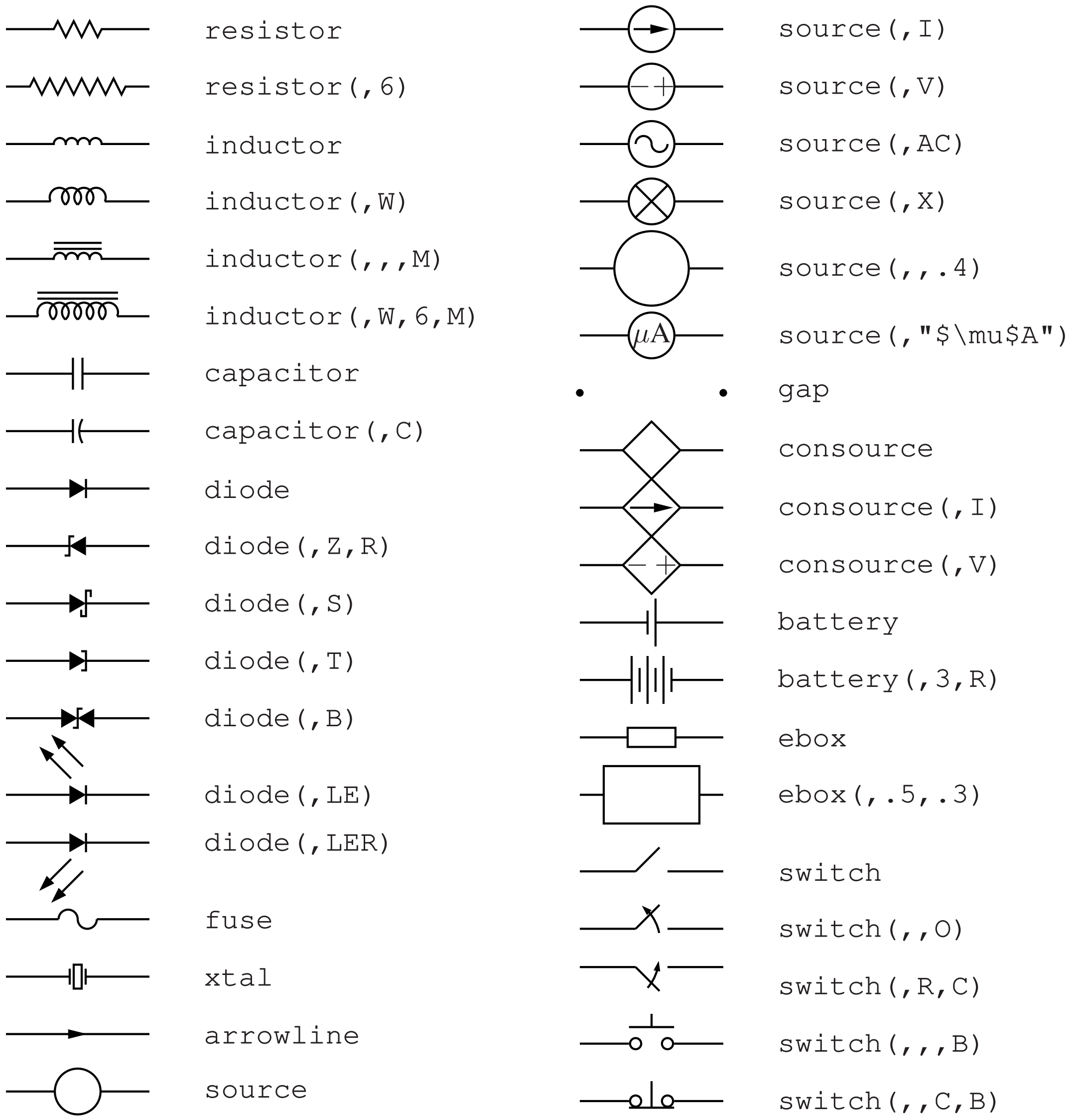


Figure 1: Two-terminal element macros, with some variations [CctTable.m4].

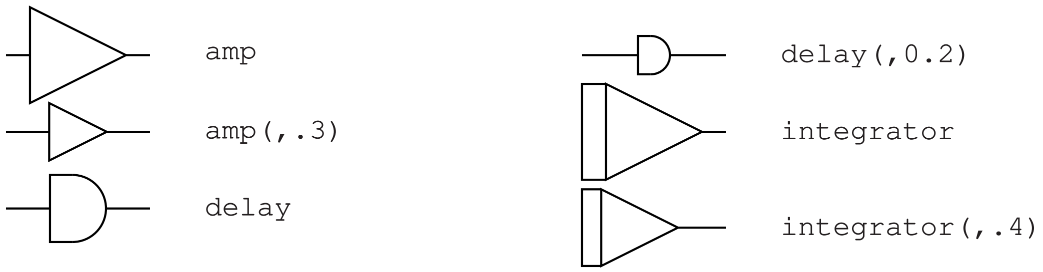


Figure 2: Amplifier, delay, and integrator [AmpTable.m4].

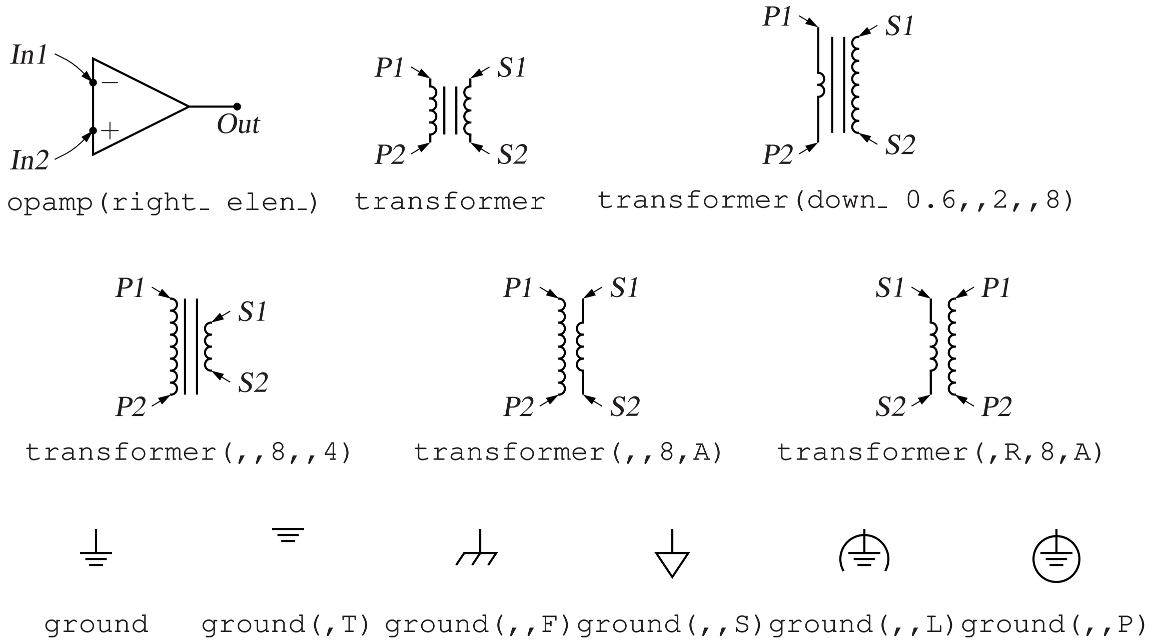


Figure 3: Miscellaneous basic elements [Misc.m4].

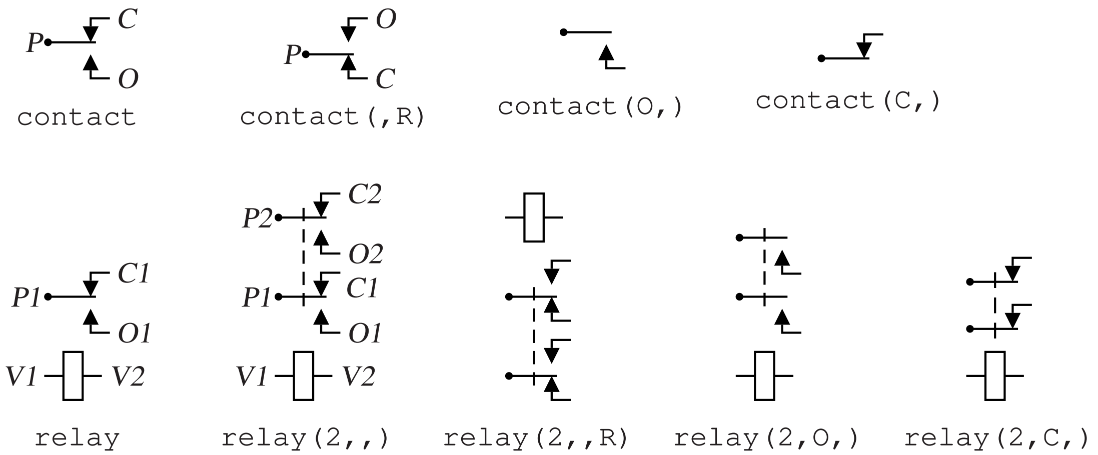


Figure 4: Variants of the contact and relay macros [Relay.m4].

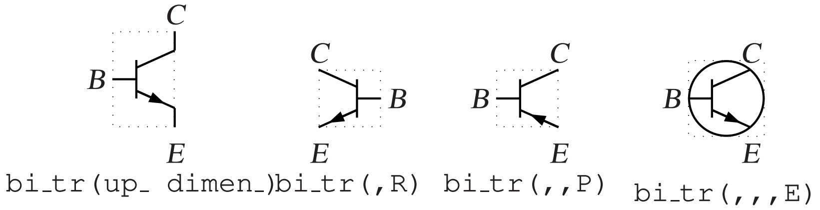


Figure 5: Bipolar transistor variants [Bip.m4].

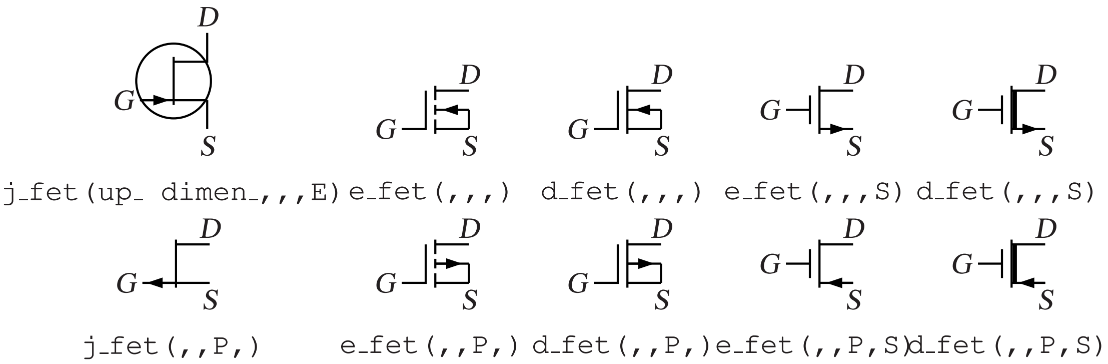


Figure 6: JFET, insulated-gate enhancement, depletion, and simplified MOSFETS [fet.m4].

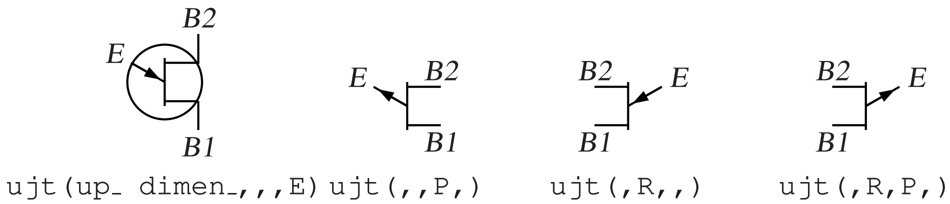


Figure 7: UJT variants [ujt.m4].

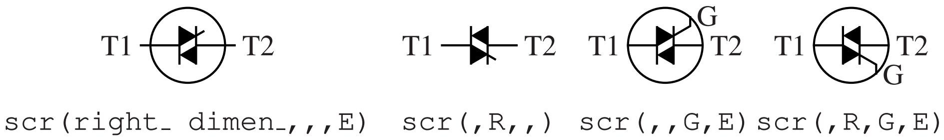


Figure 8: SCR variants [scr.m4].

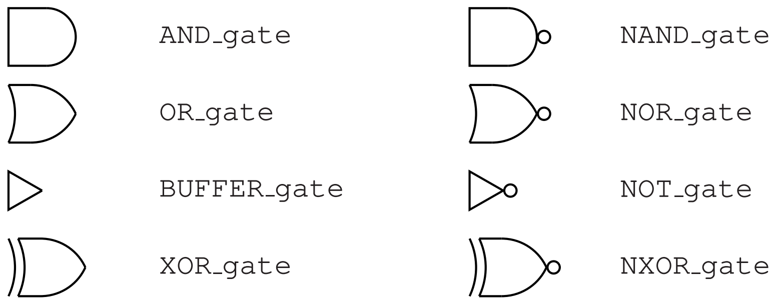


Figure 9: Basic logic gates [Liblog.m4].

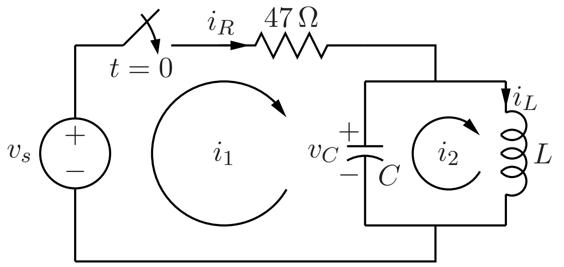


Figure 10: A simple labeled circuit [ex01.m4].

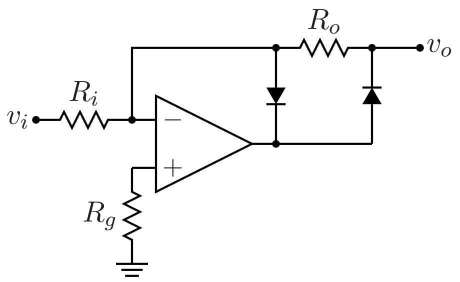


Figure 11: Precision half-wave rectifier (illustrating `opamp`, `diode`, `resistor`, `ground`, and labels) `[ex18.m4]`.

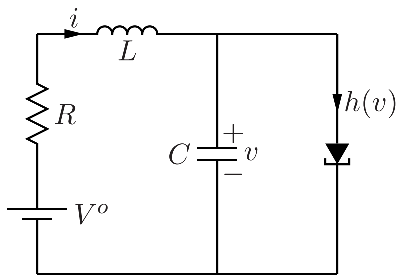


Figure 12: Tunnel diode circuit `[ex19.m4]`.

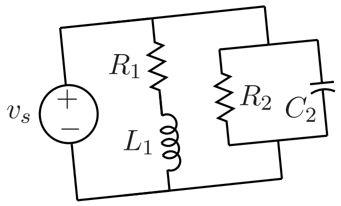


Figure 13: A skewed circuit used to test the macro `gpar_(`*element*, *element*, *separation*`)` `[gpar.m4]`.

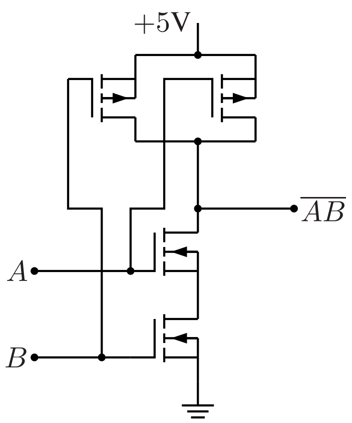


Figure 14: CMOS NAND gate `[ex12.m4]`.

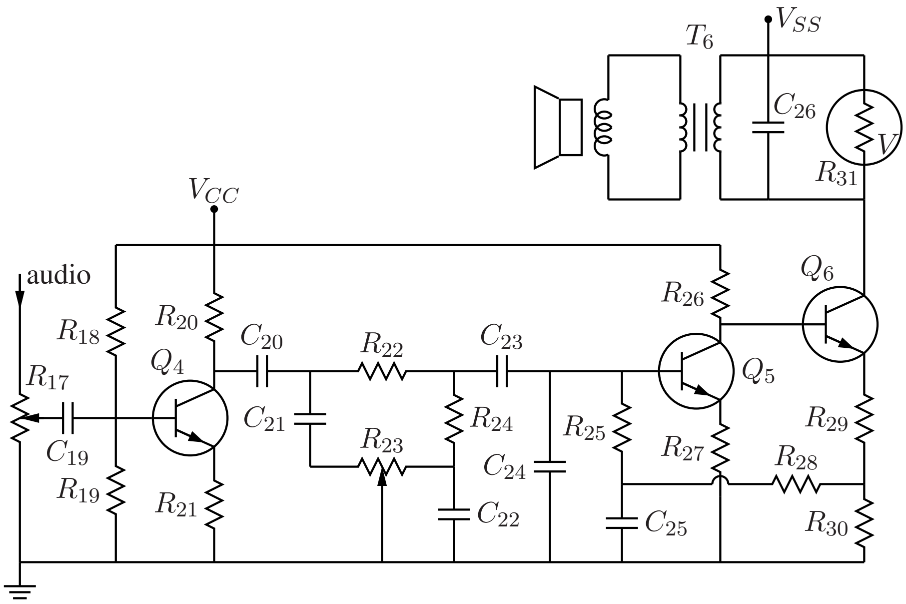


Figure 15: Transistor radio audio chain (a modest circuit with a few custom elements) `[ex11.m4]`.

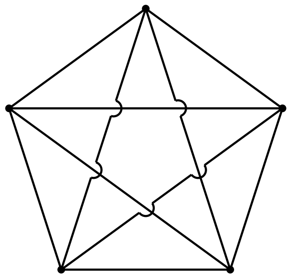


Figure 16: Non-planar graph (illustrating the `crossover` macro) `[ex10.m4]`.

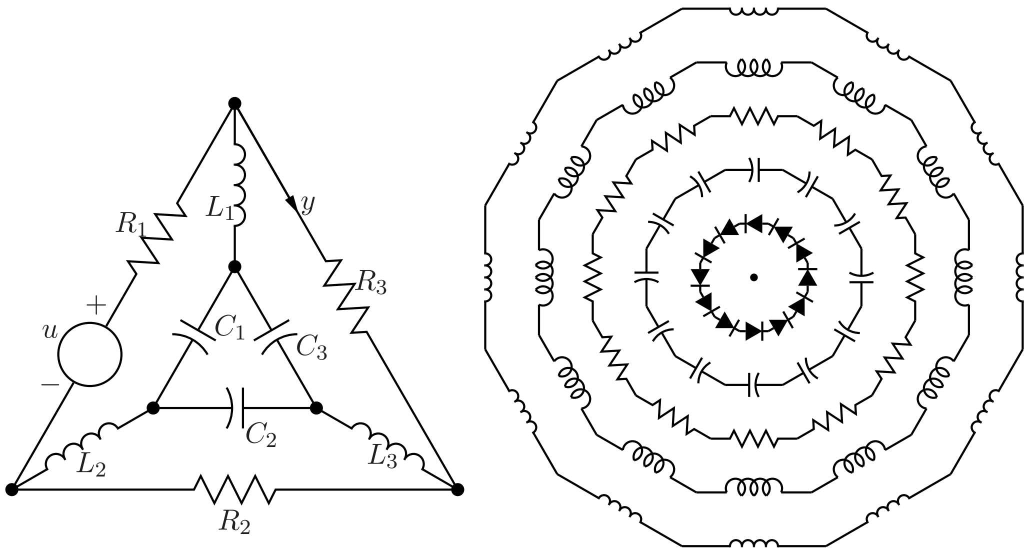


Figure 17: Elements at obtuse angles `[ex13.m4]`.

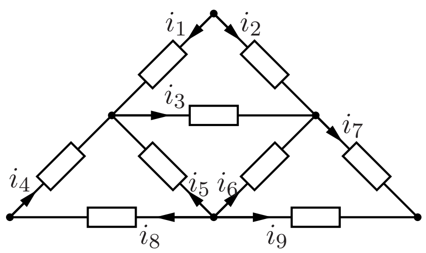


Figure 18: Labels on non-manhattan elements `[ex04.m4]`.

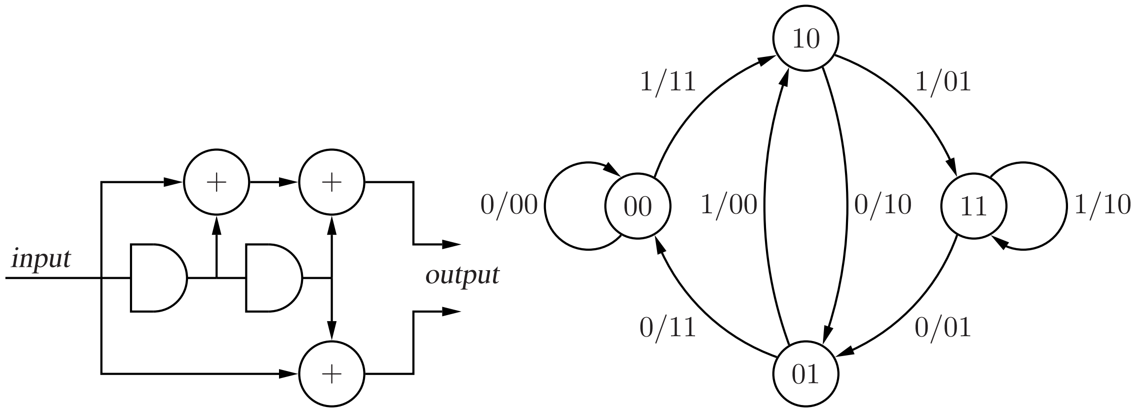


Figure 19: A rate $1/2$ binary convolutional coder and its state diagram `[ex16.m4]`.

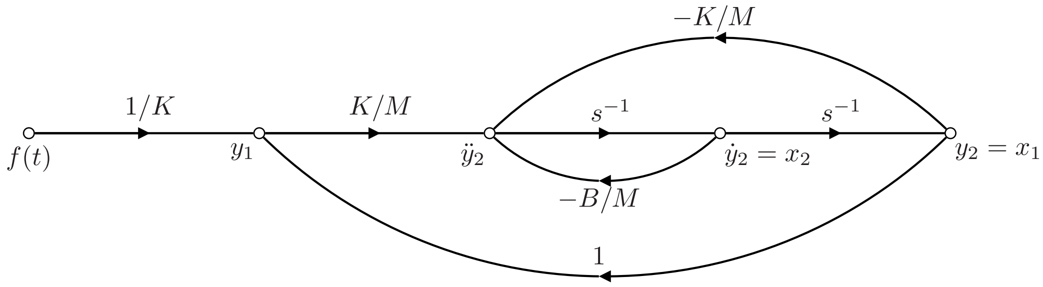


Figure 20: A signal-flow graph `[sfg.m4]`.

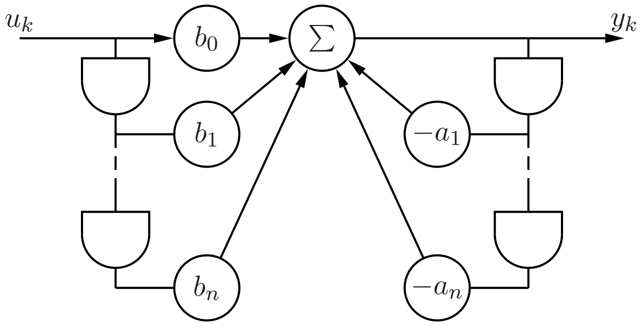


Figure 21: Digital filter `[ex03.m4]`.

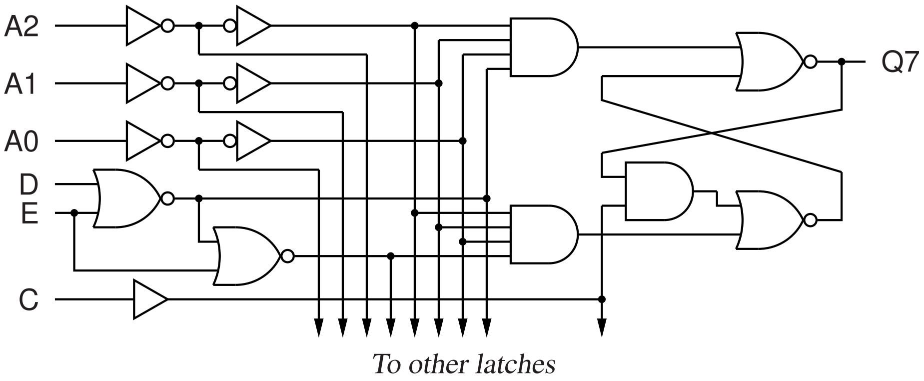


Figure 22: A small logic circuit [ex08.m4].

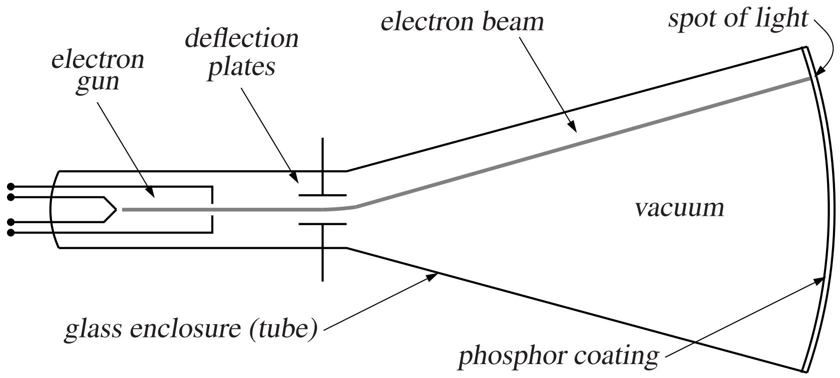


Figure 23: A line diagram [ex07.m4].

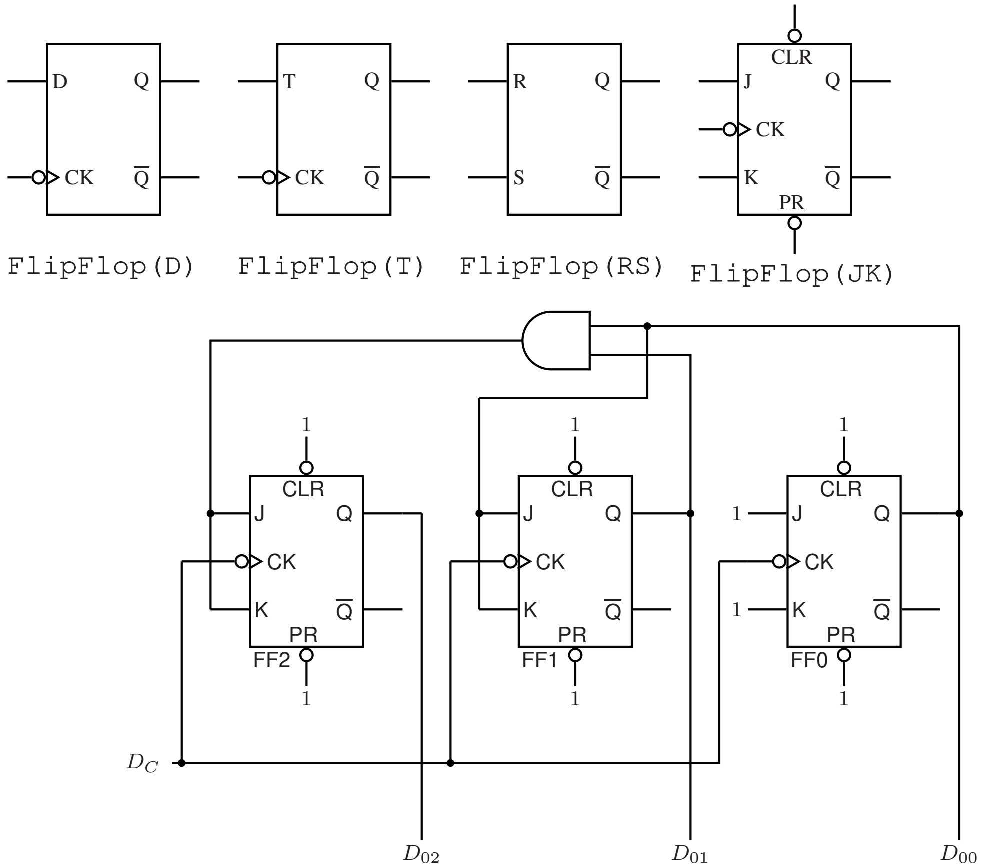


Figure 24: Experimental flip-flops [ex21.m4].

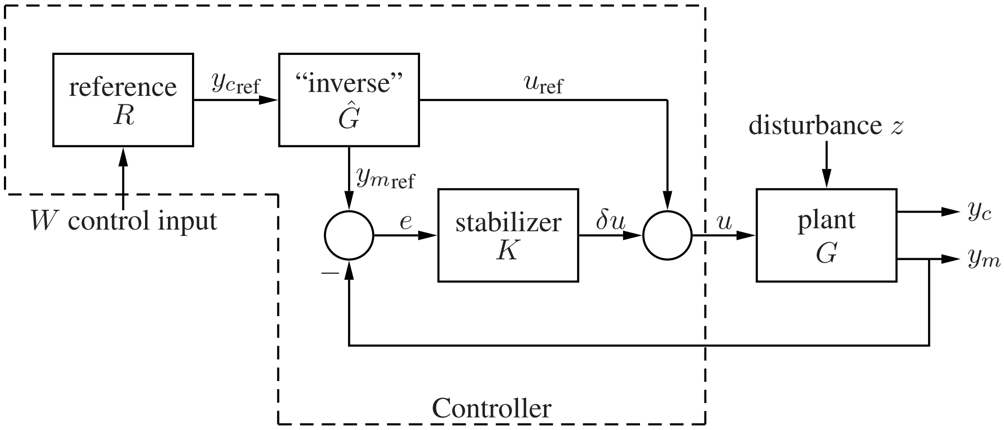


Figure 25: Control system diagram: nonlinear feedforward (for performance) and small-signal feedback (for stability) [control.m4].

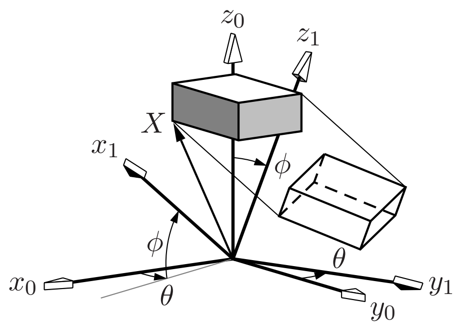


Figure 26: Test of `project` and other `lib3D` macros, showing the projection of a solid onto the y_1, z_1 plane by sighting along the x_1 axis. `[exp.m4]`.

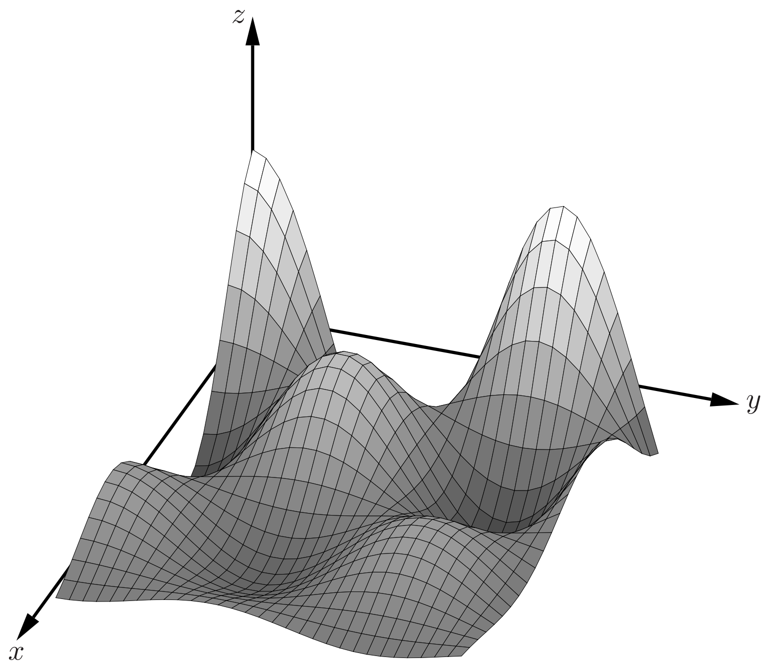
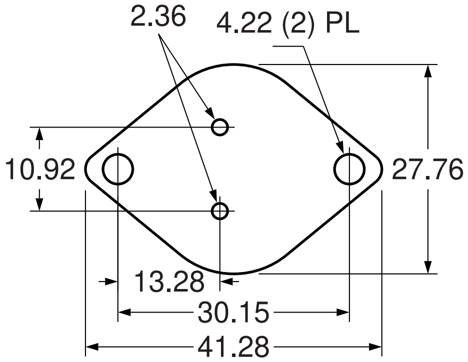
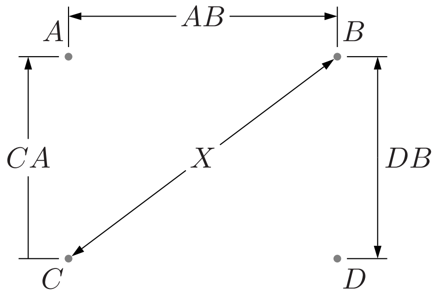
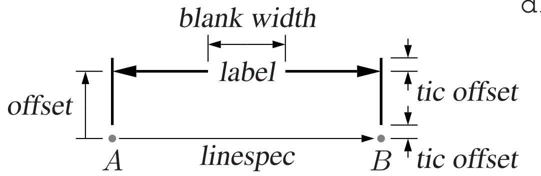


Figure 27: Plotting a surface using a gray scale `[graysurf.m4]`.






```
dimension_(from A to B,.3,$AB$,20bp__)
dimension_(from C to B,,$X$,16bp__)
dimension_(from C to A,.3,$CA$,14bp__,,->)
dimension_(from D to B,-.3,"$DB$" ljust)
```




```
dimension_(from A to B,.5,\sl label,29bp__,.1)
```

Figure 28: Illustrating the `dimension_(`*linespec*, *offset*, *label*, *blank width*, *tic offset*,`<-|->)` macro. A negative second argument signifies an offset to the right of the direction defined by *linespec*. The *label* argument is treated as a string, except that if its first character is a double quote then the argument is copied literally `[ex09.m4]`.

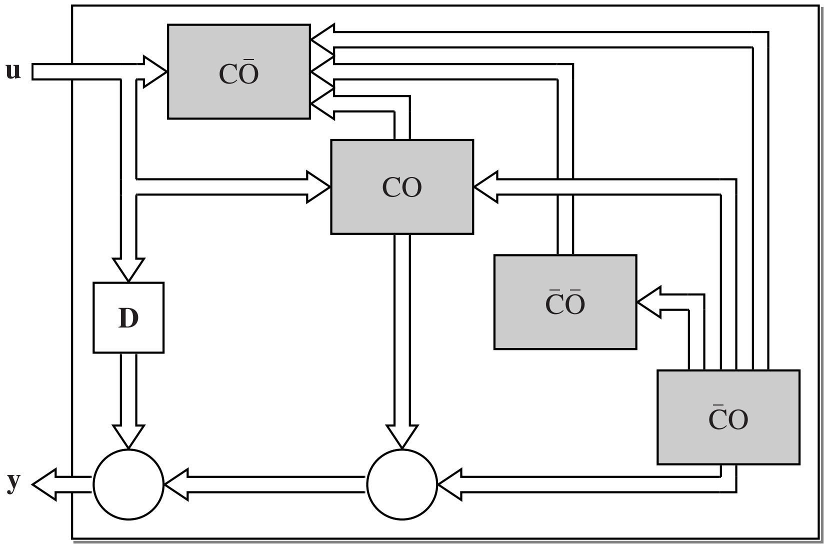


Figure 29: Use of `darrow` `[ex05.m4]`.

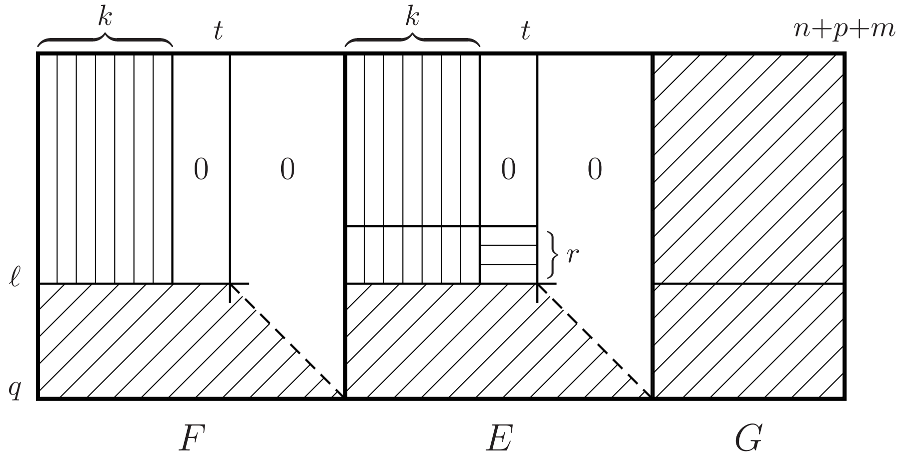


Figure 30: Crosshatching by `for` loops `[ex06.m4]`.

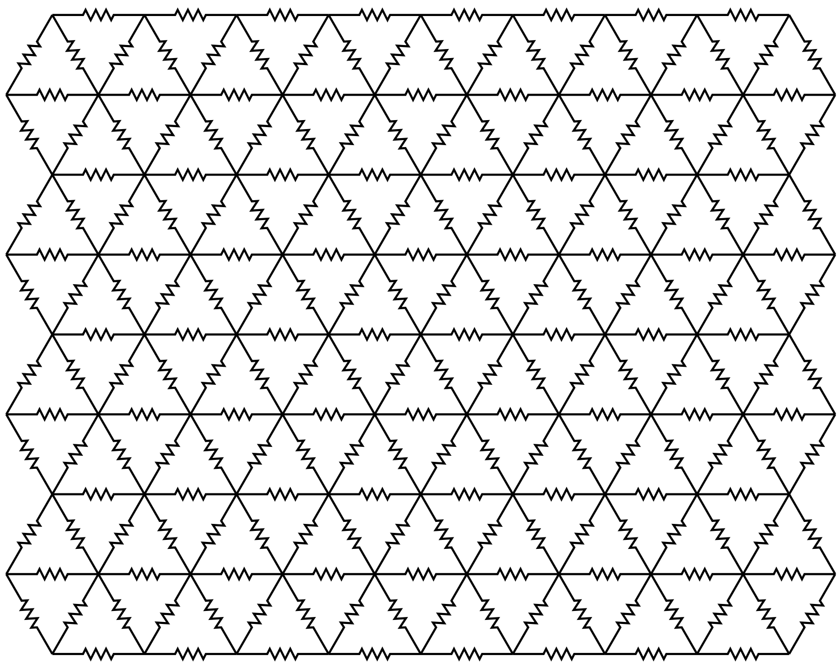


Figure 31: Repetitive network created by Pic looping `[ex17.m4]`.

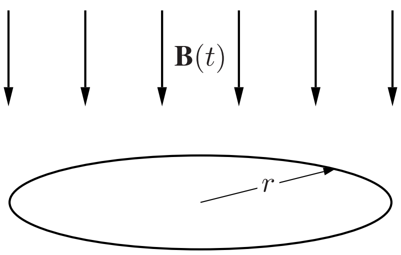


Figure 32: Magnetic field `[ex00.m4]`.

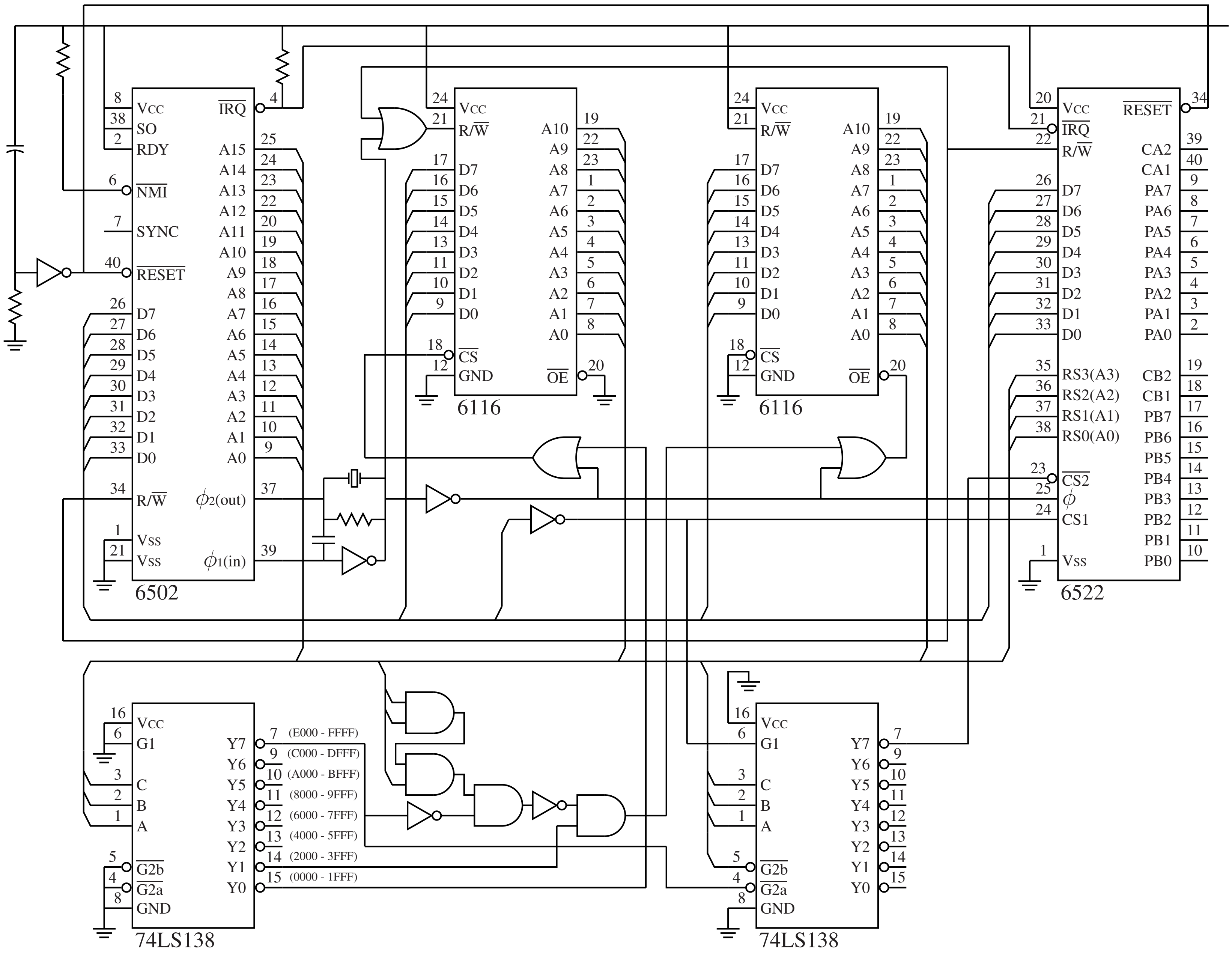


Figure 33: A digital circuit of moderate size, redrawn from M. P. Maclenan and G. M. Burns, “An Approach to Drawing Circuit Diagrams for Text Books,” Tugboat (12)1, March 1991, pp. 66-69 `[lcct.m4]`.

Figure 34: Conestoga Sailing Club (illustrating the filling of arbitrary shapes) `[csc.m4]`.

Figure 35: Redrawn from a detail of the set design for the musical *Dracula,* used for testing **dpic**. This diagram uses much LaTeX main memory `[rose.m4]`.

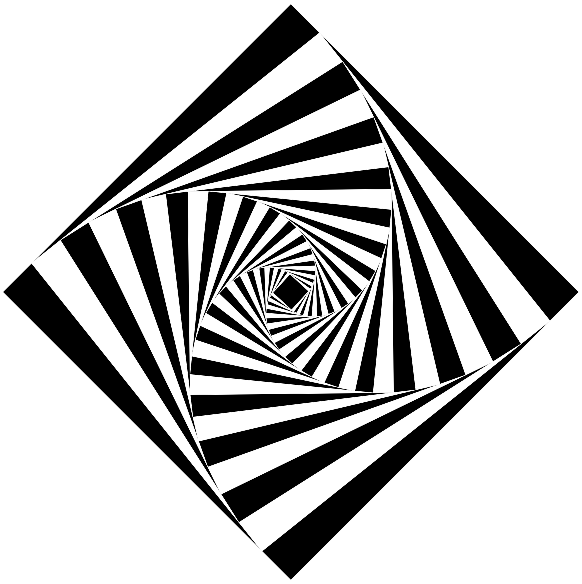


Figure 36: See M. Goossens, S. Rahtz, and F. Mittelbach, *The LaTeX Graphics Companion,* Addison-Wesley 1997, pp. 57-58 [diamond.m4].

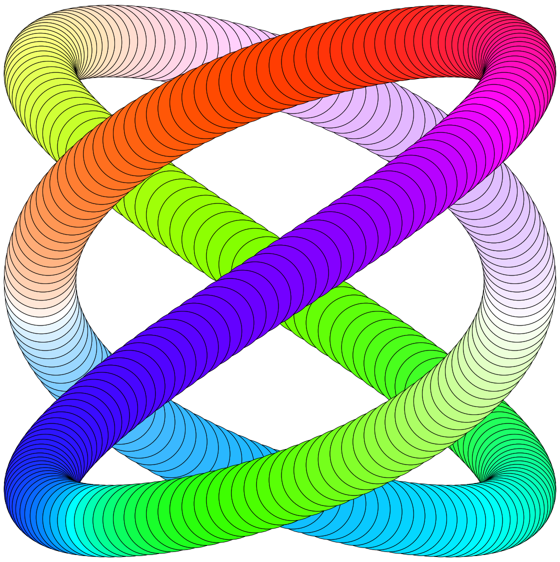


Figure 37: An exercise in calculating RGB colours [worm.m4].

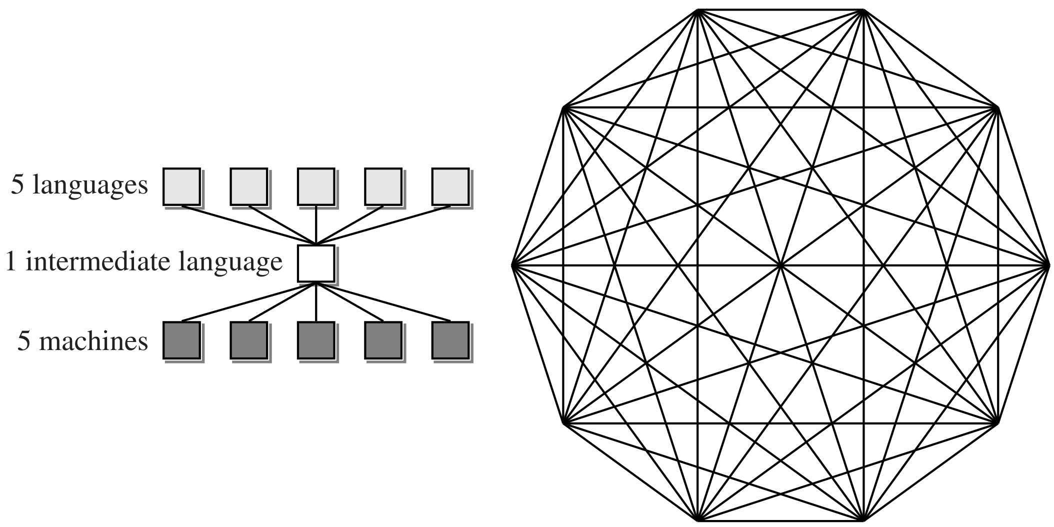


Figure 38: Simple diagrams which are easily drawn by looping [ex15.m4].

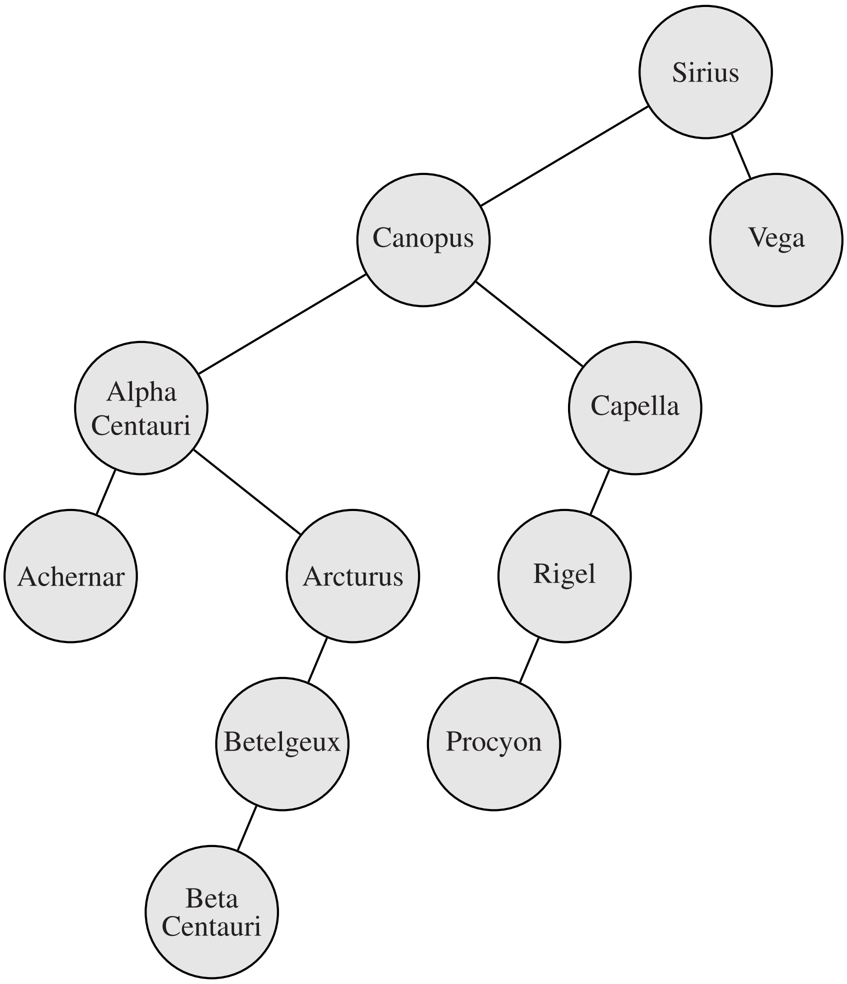


Figure 39: A binary tree [Btree.m4].

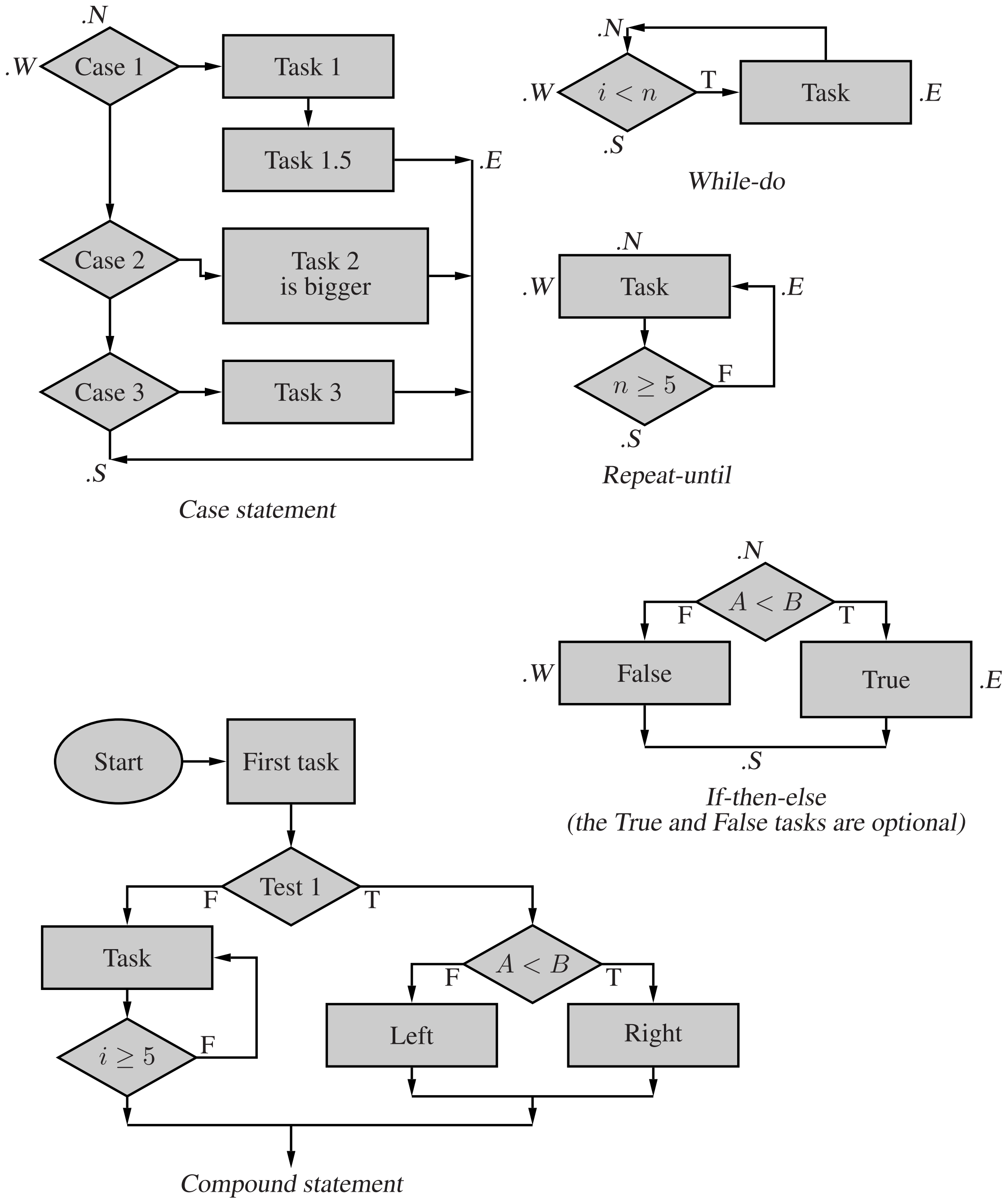


Figure 40: A flowchart sampler `[Flow.m4]`.

Figure 41: Including and drawing over eps graphics [Incleps.m4].