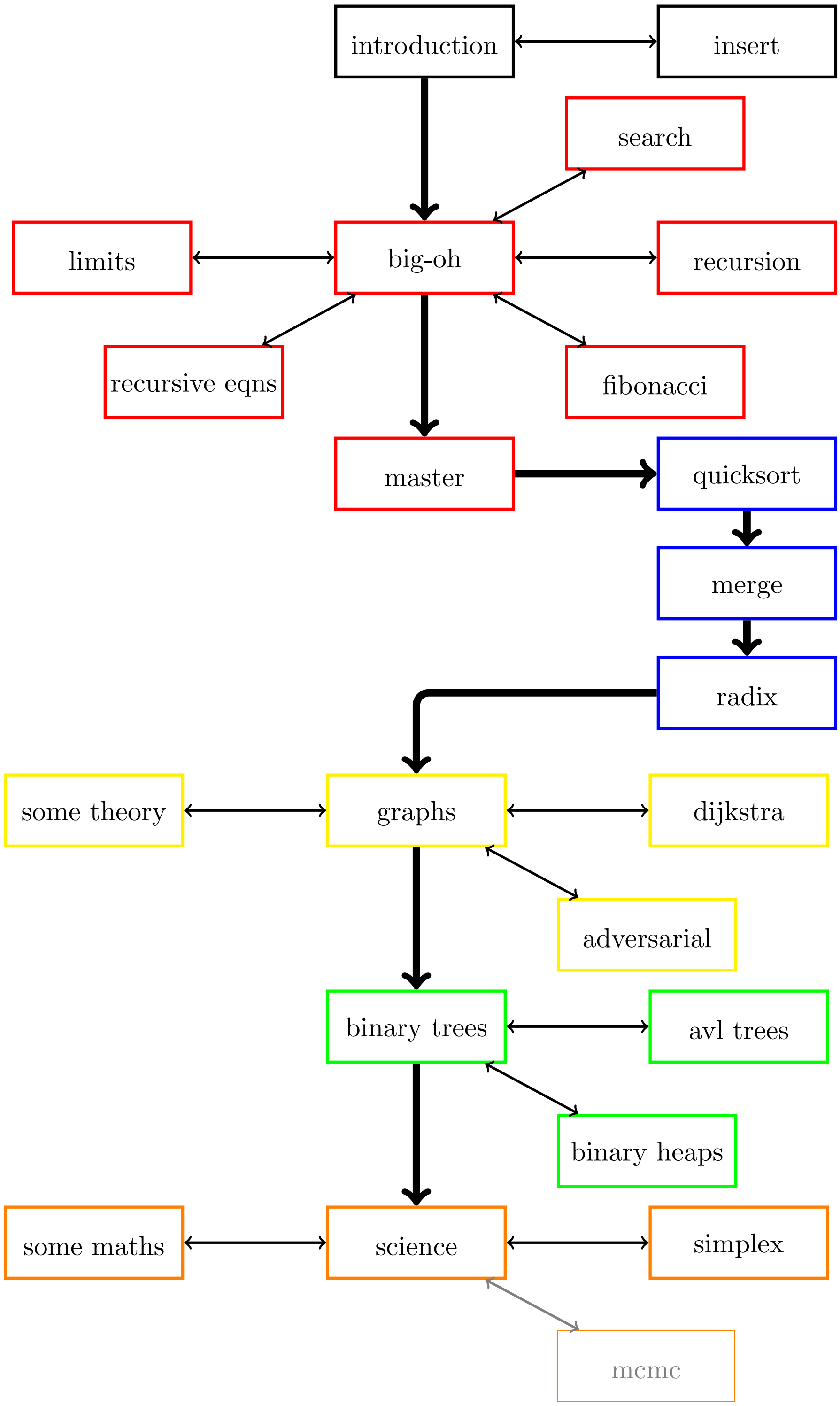
Course plan


introduction
insert
search
limits
big-oh
recursion
recursive eqns
fibonacci
master
quicksort
merge
radix
some theory
graphs
dijkstra
adversarial
binary trees
avl trees
binary heaps
some maths
science
simplex
mcmc

Key to the plan

The nodes don't represent equal amounts of time, for example, the fibonacci sequence node represents about half a lecture, whereas the big-oh node might be two lectures.

Positions and colors

- CENTRE: main topics
- LEFT: background theory
- RIGHT: examples and applications
- RED: algorithmic complexity
- BLUE: sorting
- YELLOW: graph theory
- GREEN: data structures
- ORANGE: scientific computing

Nodes

(a) **introduction:** What is an algorithm.

(b) **insert:** Insert sort, an example algorithm.

(c) **big-oh** Algorithmic complexity.

(d) **limits** Limits in the mathematical sense.

(e) **recursive eqns** How to solve recursive equations

(f) **search:** Big-oh for binart and linear.

(g) **recursion:** Recursion and recursive algorithms.

(h) **fibonacci:** The interesting example of the fibonacci sequence.

(i) **master:** The master theorem.

(j) **quicksort:** Quicksort.

(k) **merge sort:** Merge sort.

(l) **radix sort:** Radix sort.

(m) **graphs:** Introduction to graph theory.

(n) **some theory:** Some definitions and the Euler theorem.

(o) **dikstra:** Dijkskra's algorithm.

(p) **adversarial:** Adversarial search algorithms.

(q) **binary trees:** Data structures, linked lists and binary trees.

(r) **avl trees:** Balanced trees and the AVL rotations.

(s) **binary heap:** Binary heaps.

(t) **science:** Scientific computing.

(u) **some math:** Revising a bit of calculus.

(v) **simplex:** The Nelder Meade algorithm.

(w) **mcmc:** Markov chain Monte Carlo

The last section is aspirational, it is likely there will not be time to discuss them and they will not be examined.