- uninformed search
  - breadth-first
  - uniform-cost
  - depth-first
  - depth-limited
  - iterative deepening depth-first

Algorithms have no additional information on the goal node other than the ones provided in the problem definition

- informed search
  - greedy best-first search
  - A*
    - iterative deepening A* (IDA*)
    - recursive best-first search (RBFS)
    - simple memory bounded A* (SMA*)

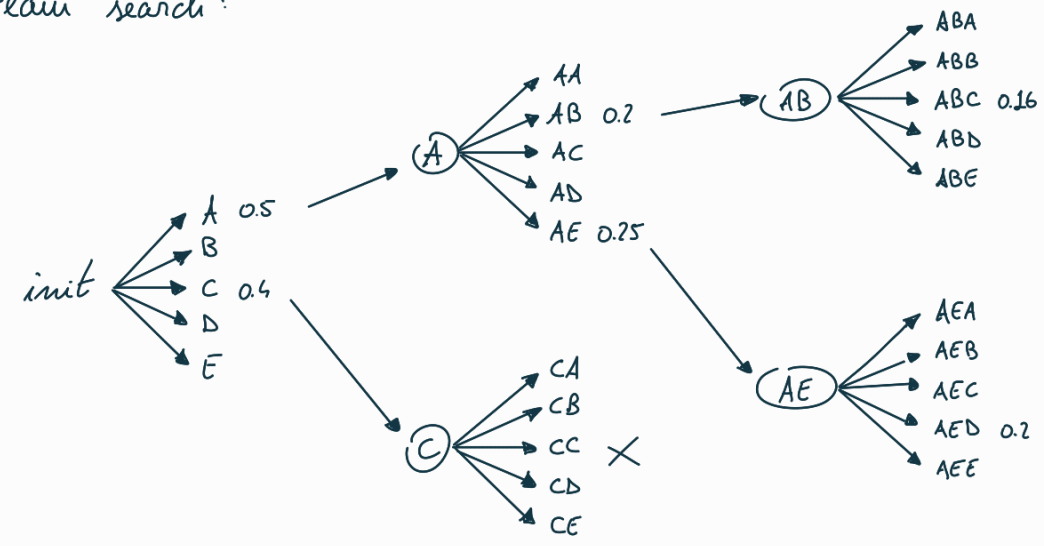
Algorithms have information on the goal state which helps in more efficient searching. This information is obtained by a function that estimates how close a state is to the goal state.

- local search
  - hill-climbing search ~ gradient descent
    - stochastic hill-climbing: choose randomly from the uphill moves
    - first choice hill-climbing: randomly generates successors until a better one is found
    - random restart hill-climbing *: randomly generates init state
  - simulated annealing *: picks a random move every time; if it decreases the cost it is accepted
  - beam search (asexual reproduction)
  - genetic algorithms

Local search makes a change in perspective in the search for a solution as compared to other kind of searchs that starts from an initial state and applies operators to reach the goal. Here we don't care about the steps, we only care about the solution: we can start from a candidate solution and find the optimal one. At each iteration we make a small change (perturbation) and then we check how good the newly found solution is with a fitness function (how good the result of this change is). It is not unlikely that the search will stop without finding any solution → we can only iterate the search starting from a new candidate solution.

* Difference between <u>random restart</u> and <u>beam search</u>:
with random restart we have K independent instances of the same process while in the beam search one process is influenced by the others. With the beam search all the solutions converge in the same spot.

beam search:


init
A 0.5
B
C 0.4
D
E
A
AA
AB 0.2
AC
AD
AE 0.25
C
CA
CB
CC
CD
CE
AB
ABA
ABB
ABC 0.16
ABD
ABE
AE
AEA
AEB
AEC
AED 0.2
AEE