

Base concepts

1.

Heuristic

meaning from dictionary:

1. Art of inventing or discovering;
2. method intended to lead to invent, discover, or solve problems.

In Computer Science, heuristics means the art of discovering new strategies (rules) to solve problems.

Optimum Solution - solution that has the best cost (best objective function value).

Example Fig. 12.2,
p. 282

The search tree generated by the best-first algorithm is represented in the program by terms of two types:

- $l(n, F/G)$ → Represents a leaf node

node $g(n)$

$$f(n) = g(n) + h(n)$$

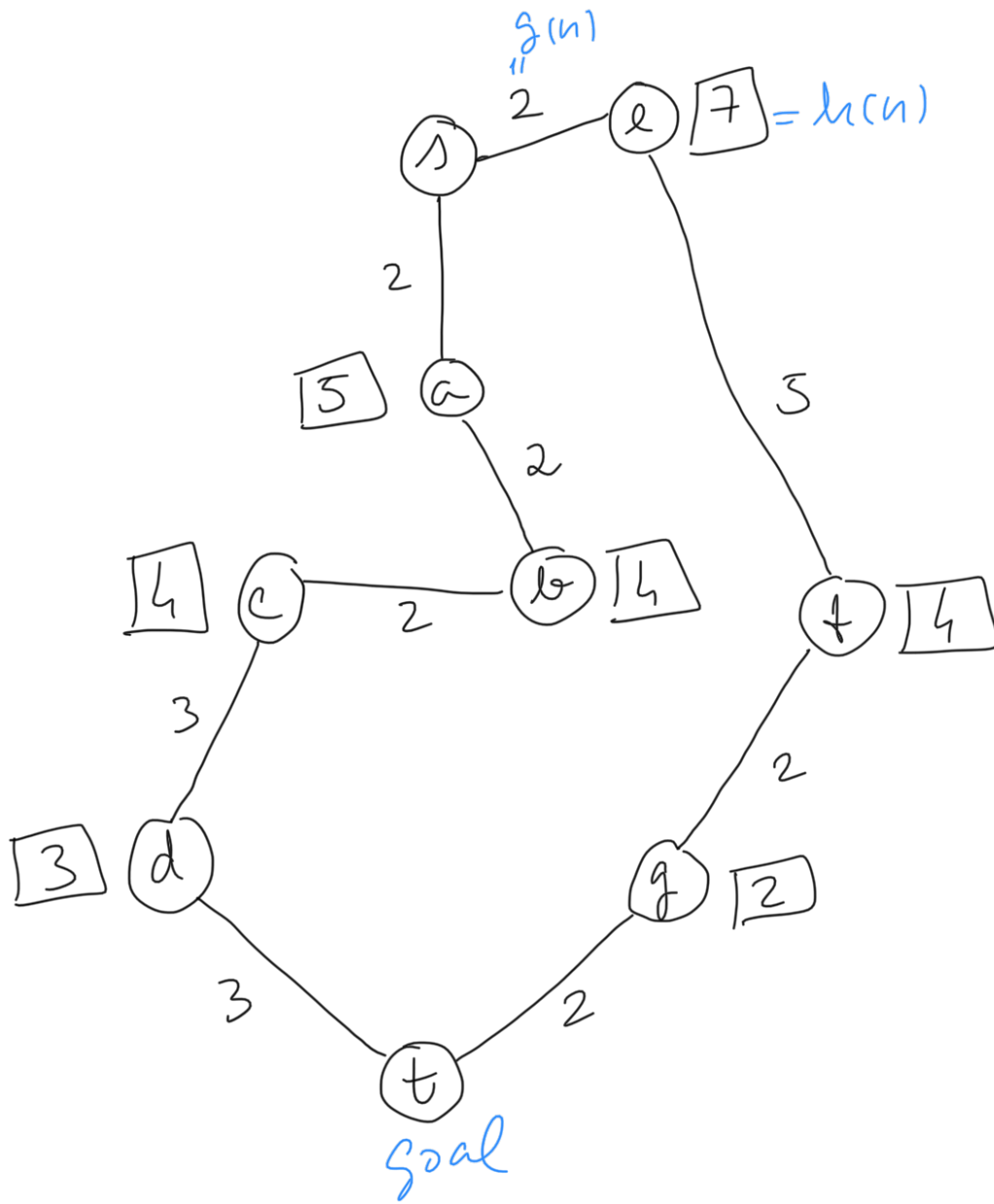
cost
of reaching
node n

Heuristic function
(heuristic cost
estimate)

- $t(n, F/G, SSS)$ → Represents tree containing non-empty subtrees, SSS , having n as root node.

F denotes the f -value of best cost subtree.

3.



Expansion carried out

4.

$$l(s, 0/0)$$

↓

$$t(s, 7/0, [l(a, 7/2), l(e, 9/2)])$$

↓

Expands $l(a, 7/2)$ using
Bound = 9 (Bound of the best
alternative)

$$t(s, 9/0, [l(e, 9/2),$$

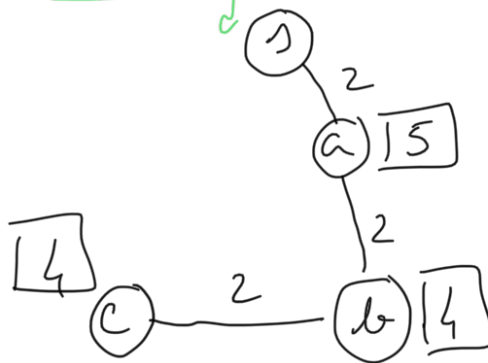
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$$t(a, 10/2, [t(b, 10/4, [l(c, 10/6)])])$$

]



Represents
this
path

5.

↓ Expands $l(e, 9/2)$
using Bound = 10

$t(a, 10/0, [t(a, 10/2, [t(b, 10/4, [l(c, 10/6)])])],$
 $t(e, 11/2, [l(f, 11/7)])]$
 ↓
 Alternatives

↓ Expands $t(a, 10/2, \dots)$ using Bound = 11
 $t(a, 11/0, [t(e, 11/2, [l(f, 11/7)])],$
 $t(a, 12/2, [t(b, 12/4, [t(c, 12/6, [l(d, 12/9)])])])]$
 ↓

↓ Expand $t(2, 11/2, \dots)$ 6.

using Bound = 12

$t(1, 11/0, [t(2, 11/2, [t(f, 11/7,$
[$t(g, 11/9, [2(t, 11/11)]))$]
])
,
 $t(a, 12/2, \dots)$
])
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