Best First Search

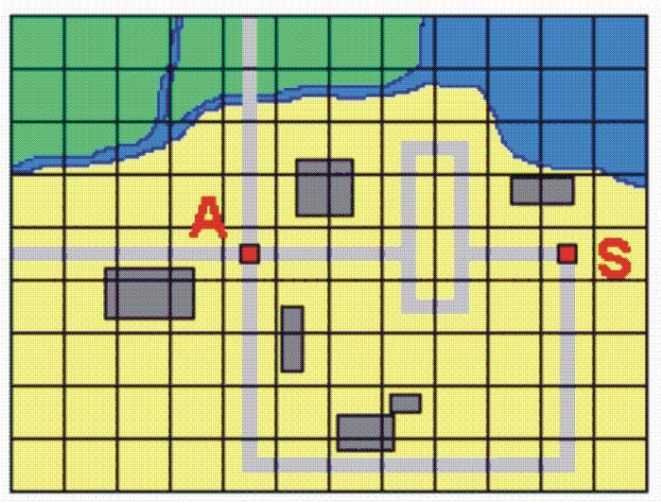
Best First Search is a combination of Depth First Search and Breadth First Search. This is following one path, but changing to another if it is better than the current one. To decide which path is better we use function f=f1+f2.

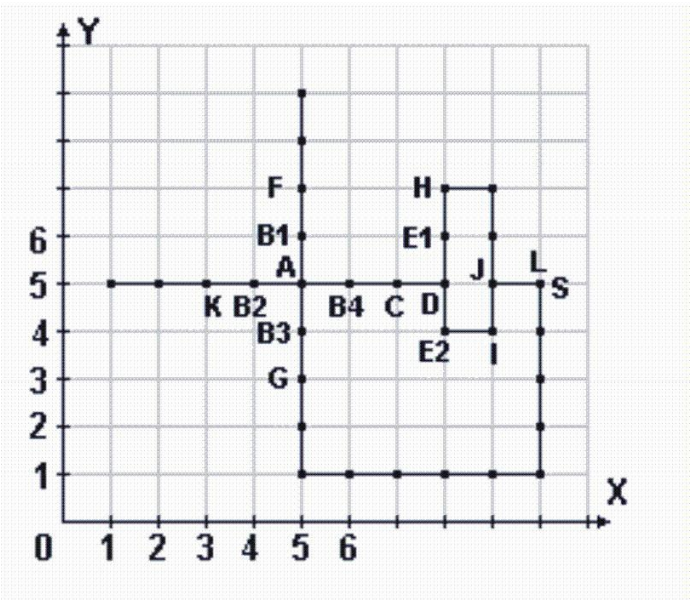
f1 – it is the path cost from the starting state to the current state,

f2 – it is the path cost from the current state to the end

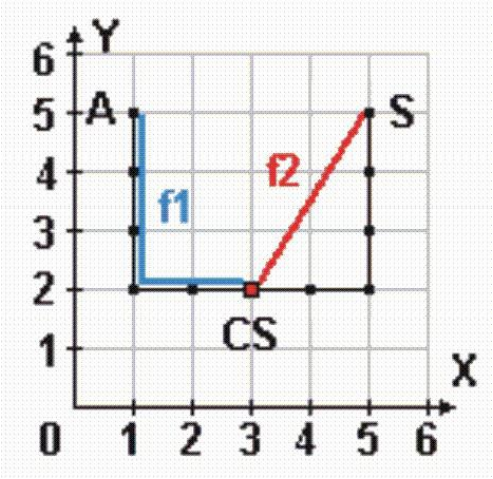
Example

We have following map.





We calculate values of f as follows.



Algorithm

1. Generating all states available from the state A: B1, B, B3, B4
    a. B1 = 1 + sqrt(26) = 6,1
    b. B2 = 1 + 6 = 7
    c. B3 = 1 + sqrt(26) = 6,1
    d. B4 = 1 + 4 = 5

    The best is B4
2. Generating all states available from the state B4: C
    a. B1 = 1 + sqrt(26) = 6,1
    b. B2 = 1 + 6 = 7
    c. B3 = 1 + sqrt(26) = 6,1
    d. C = 2 + 3 =5

    The best is C

3. Generating all states available from the state C: D
    a. B1 = 1 + sqrt(26) = 6,1
    b. B2 = 1 + 6 = 7
    c. B3 = 1 + sqrt(26) = 6,1
    d. D = 3 + 2 =5

    The best is D
4. Generating all states available from the state D: E1, E2
    a. B1 = 1 + sqrt(26) = 6,1

b. B2 = 1 + 6 = 7
c. B3 = 1 + sqrt(26) = 6,1
d. E1 = 4 + sqrt(5) = 6,2
e. E2 = 4 + sqrt(5) = 6,2

The best is B1

5. Generating all states available from the state B1: F
    a. F = 2 + sqrt(29) = 7,4
    b. B2 = 1 + 6 = 7
    c. B3 = 1 + sqrt(26) = 6,1
    d. E1 = 4 + sqrt(5) = 6,2
    e. E2 = 4 + sqrt(5) = 6,2

    The best is B3
6. Generating all states available from the state B3: G
    a. F = 2 + sqrt(29) = 7,4
    b. B2 = 1 + 6 = 7
    c. G = 2 + sqrt(29) = 7,4
    d. E1 = 4 + sqrt(5) = 6,2
    e. E2 = 4 + sqrt(5) = 6,2

    The best is E1
7. Generating all states available from the state E1: H
    a. F = 2 + sqrt(29) = 7,4
    b. B2 = 1 + 6 = 7
    c. G = 2 + sqrt(29) = 7,4
    d. H = 5 + sqrt(8) = 7,8
    e. E2 = 4 + sqrt(5) = 6,2

    The best is E2
8. Generating all states available from the state E2: I
    a. F = 2 + sqrt(29) = 7,4
    b. B2 = 1 + 6 = 7
    c. G = 2 + sqrt(29) = 7,4
    d. H = 5 + sqrt(8) = 7,8
    e. I = 5 + sqrt(2) = 6,4

    The best is I
9. Generating all states available from the state I: J

a. F = 2 + sqrt(29) = 7,4
b. B2 = 1 + 6 = 7
c. G = 2 + sqrt(29) = 7,4
d. H = 5 + sqrt(8) = 7,8
e. J = 6 + 1 = 7

The best is B2

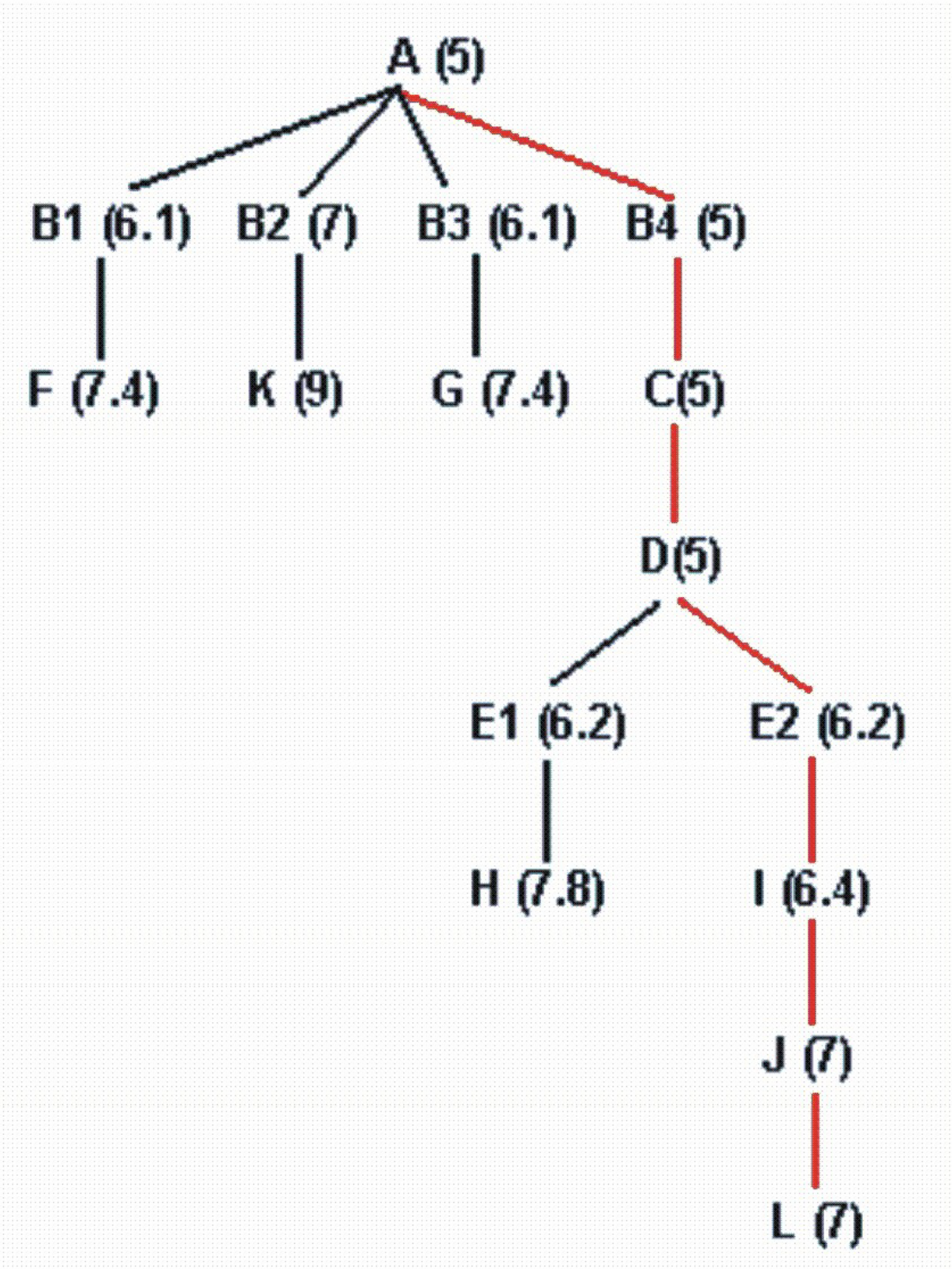
10. Generating all states available from the state B2: K
    a. F = 2 + sqrt(29) = 7,4
    b. K = 2 + 7 = 9
    c. G = 2 + sqrt(29) = 7,4
    d. H = 5 + sqrt(8) = 7,8
    e. J = 6 + 1 = 7

    The best is J

11. Generating all states available from the state J: L
    a. F = 2 + sqrt(29) = 7,4
    b. K = 2 + 7 = 9
    c. G = 2 + sqrt(29) = 7,4
    d. H = 5 + sqrt(8) = 7,8
    e. L = 7 + 0 = 7

    The best is L

12. L is the end point


A (5)
B1 (6.1)
B2 (7)
B3 (6.1)
B4 (5)
F (7.4)
K (9)
G (7.4)
C(5)
D(5)
E1 (6.2)
E2 (6.2)
H (7.8)
I (6.4)
J (7)
L (7)