IC 817
Inteligencia Artificial

Professor

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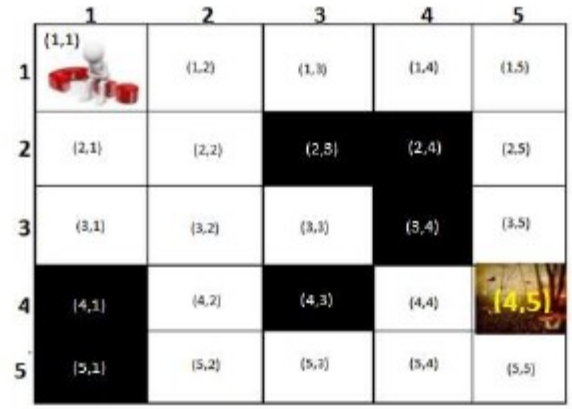
UFFRJ

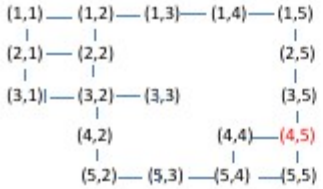
Exercicio

Matriz:

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 1 & 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 & 0 \end{bmatrix}$$



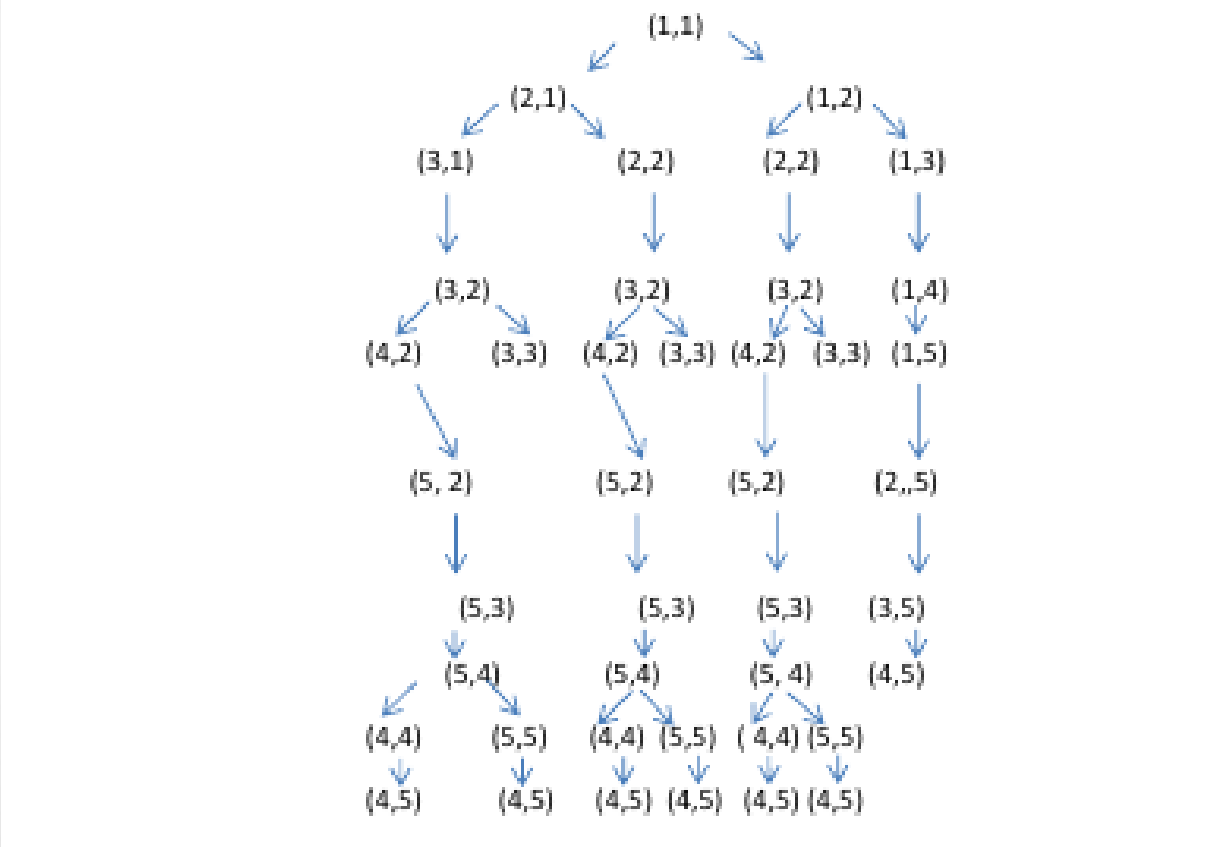
Grafo:



Objetivo : Encontrar o caminho
Representação : Matriz
Estado Inicial: (1,1)
Estado Final : (4,5)

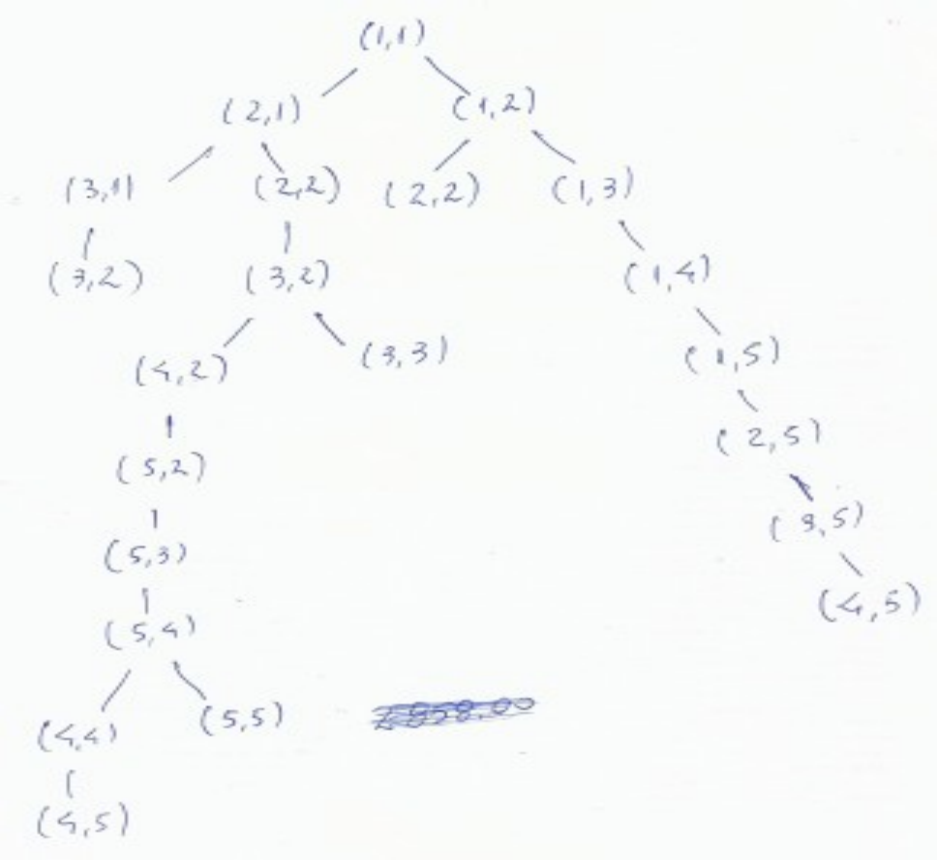
Exercicio

Arvore Completa



Exercicio

Outra Modelagem



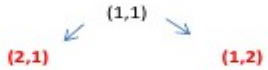
Exercicio

Mostrar Graficamente as seguintes buscas:

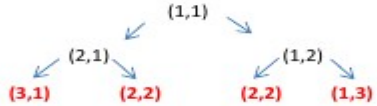
(a) por largura (em vermelho a etapa que se refere)

1 Etapa: **(1,1)**

2 Etapa:



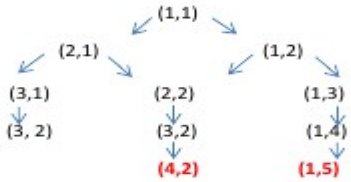
3 Etapa:



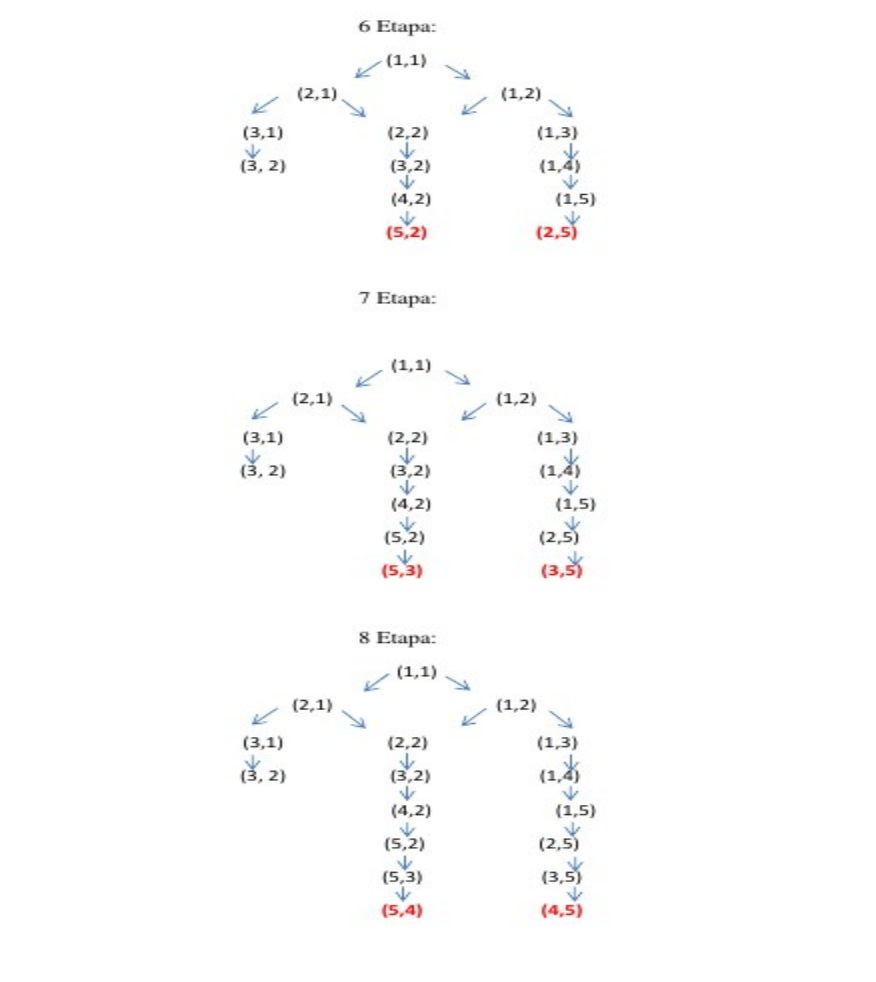
4 Etapa:

:

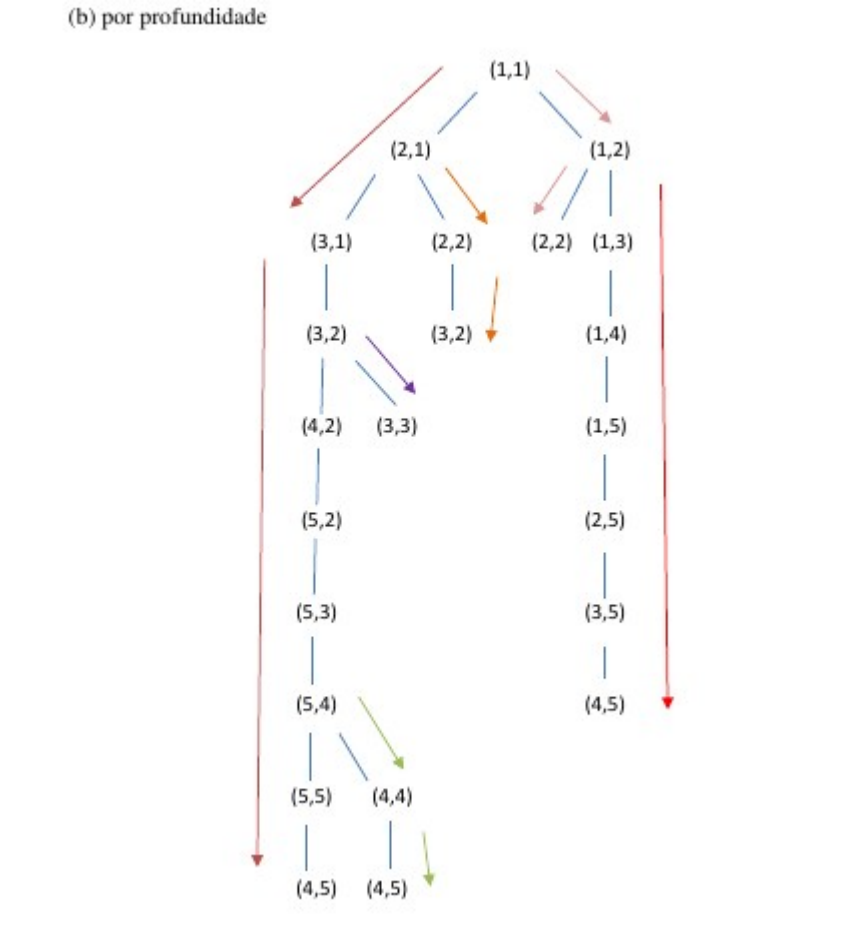
5 Etapa:



Exercicio


6 Etapa:
(1,1)
(2,1)
(1,2)
(3,1)
(2,2)
(1,3)
(3, 2)
(3,2)
(1,4)
(4,2)
(1,5)
(5,2)
(2,5)
7 Etapa:
(1,1)
(2,1)
(1,2)
(3,1)
(2,2)
(1,3)
(3, 2)
(3,2)
(1,4)
(4,2)
(1,5)
(5,2)
(2,5)
(5,3)
(3,5)
8 Etapa:
(1,1)
(2,1)
(1,2)
(3,1)
(2,2)
(1,3)
(3, 2)
(3,2)
(1,4)
(4,2)
(1,5)
(5,2)
(2,5)
(5,3)
(3,5)
(5,4)
(4,5)

Exercicio


(b) por profundidade
(1,1)
(2,1)
(1,2)
(3,1)
(2,2)
(2,2)
(1,3)
(3,2)
(3,2)
(1,4)
(4,2)
(3,3)
(1,5)
(5,2)
(2,5)
(5,3)
(3,5)
(5,4)
(4,5)
(5,5)
(4,4)
(4,5)
(4,5)

Exercicio

Busca Profundidade :

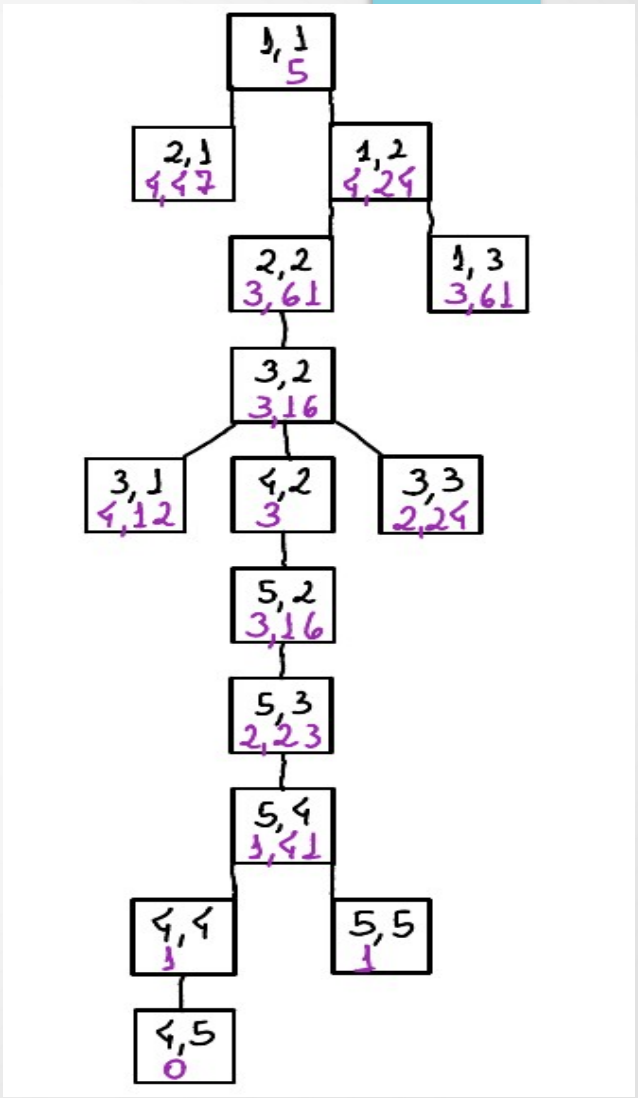
Sequ^encia :

(1,1) → (2,1) → (3,1) → (3,2) → (4,2) → (5,2) → (5,3) → (5,4) → (5,5) → (4,5)

Exercicio

Busca Gulosa

Nós:	H(x)	Nós:	H(x)
1,1	5	3,3	2,24
1,2	4,24	3,5	1
1,3	3,61	4,2	3
1,4	3,16	4,4	1
1,5	3	4,5	0
2,1	4,47	5,2	3,16
2,2	3,61	5,3	2,23
2,5	1,41	5,4	1,41
3,1	4,12	5,5	1
3,2	3,16		



Exercicio

(d) A * (Distância Euclidiana entre 2 pontos)

Para calcular a distância euclidiana, utilizamos a fórmula abaixo :

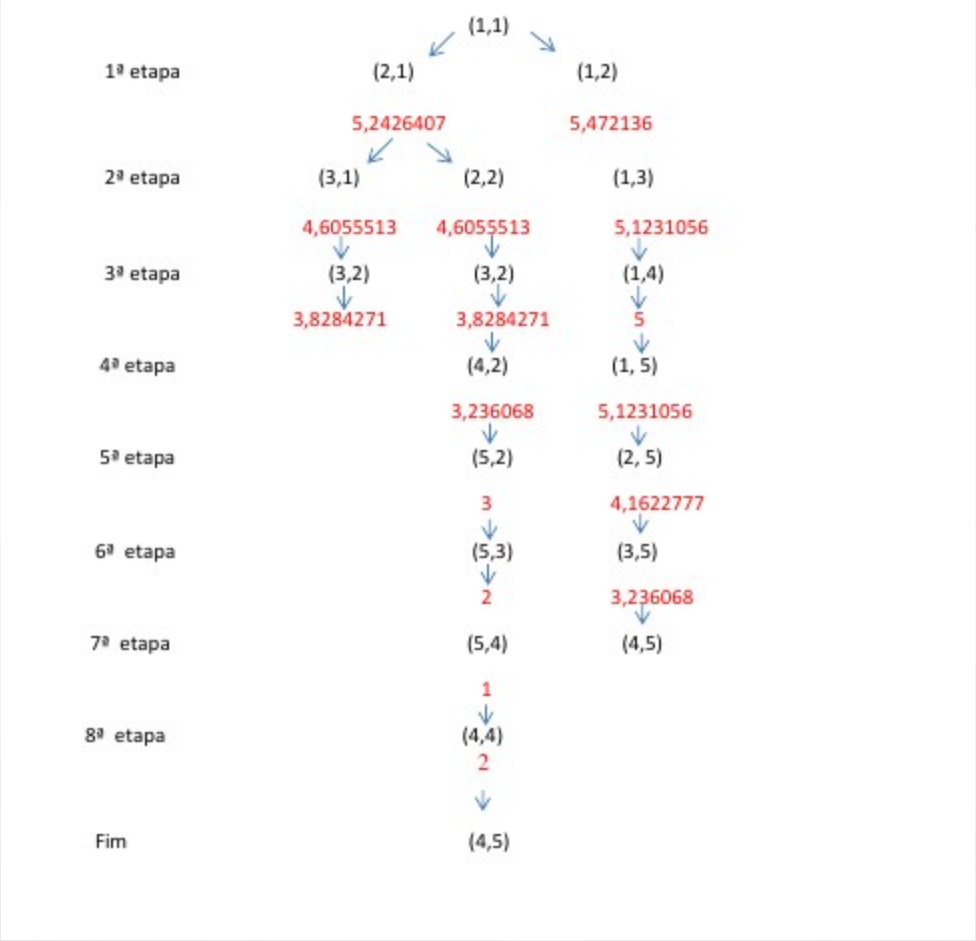
$$f = g + h$$

$$E(2,1) = 1 + \sqrt{(5-2)^2 + (4-1)^2} = 5{,}242640687 \text{ ou } 1 + 3\sqrt{2}$$

$$E(1,2) = 1 + \sqrt{(5-1)^2 + (4-2)^2} = 5{,}472135955 \text{ ou } 1 + 2\sqrt{5}$$

Contador (E)		Distância Euclidiana
X	Y	
2	1	5,242640687
1	2	5,472135955
3	1	4,605551275
2	2	4,605551275
1	3	5,123105626
3	2	3,828427125
1	4	5
4	2	3,236067977
1	5	5,123105626
5	2	3
2	5	4,16227766
5	3	2
3	5	3,236067977
5	4	1
4	4	2
3	5	3,236067977
5	5	2

Exercicio


(1,1)
1ª etapa
(2,1)
(1,2)
5,2426407
5,472136
2ª etapa
(3,1)
(2,2)
(1,3)
4,6055513
4,6055513
5,1231056
3ª etapa
(3,2)
(3,2)
(1,4)
3,8284271
3,8284271
5
4ª etapa
(4,2)
(1, 5)
3,236068
5,1231056
5ª etapa
(5,2)
(2, 5)
3
4,1622777
6ª etapa
(5,3)
(3,5)
2
3,236068
7ª etapa
(5,4)
(4,5)
1
8ª etapa
(4,4)
2
Fim
(4,5)