2.1 – GERANDO LABIRINTO

3 – TEMPO DE EXECUÇÃO E SOLUÇÕES ENCONTRADAS
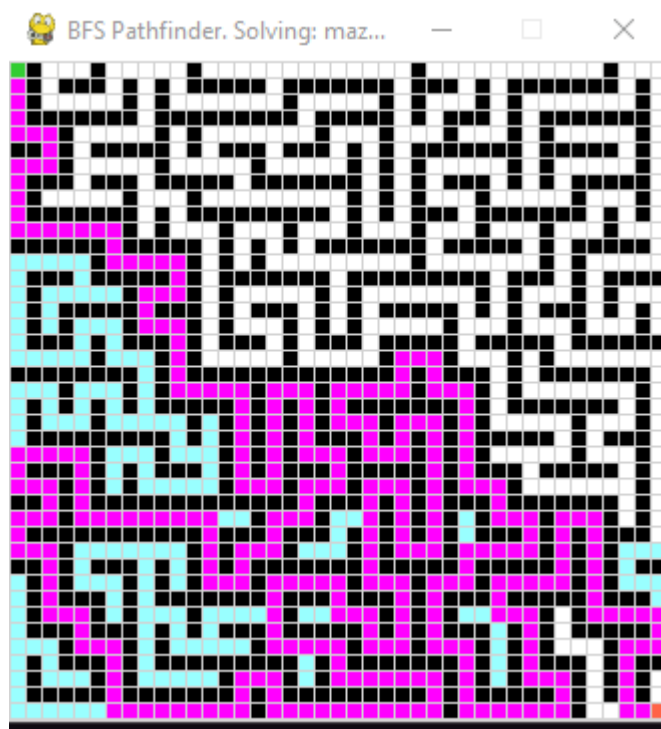
A*

TEMPO: 10.435s

BFS (Busca por largura)

PS C:\Users\gusth\Downloads\codigos\ai-maze-python-master> python bfs_pathfinder.py --maze_file=maze_0.csv --display=1
pygame 2.1.2 (SDL 2.0.18, Python 3.10.4)
Hello from the pygame community. https://www.pygame.org/contribute.html
Solved! Click exit.
--- finished 9.257 s---

TEMPO: 9.257s

DFS (Busca por profundidade)


```
PS C:\Users\gusth\Downloads\codigos\ai-maze-python-master> python dfs_pathfinder.py --maze_file=maze_0.csv --display=1
pygame 2.1.2 (SDL 2.0.18, Python 3.10.4)
Hello from the pygame community. https://www.pygame.org/contribute.html
Solved! Click exit.
--- finished 15.713 s---
```
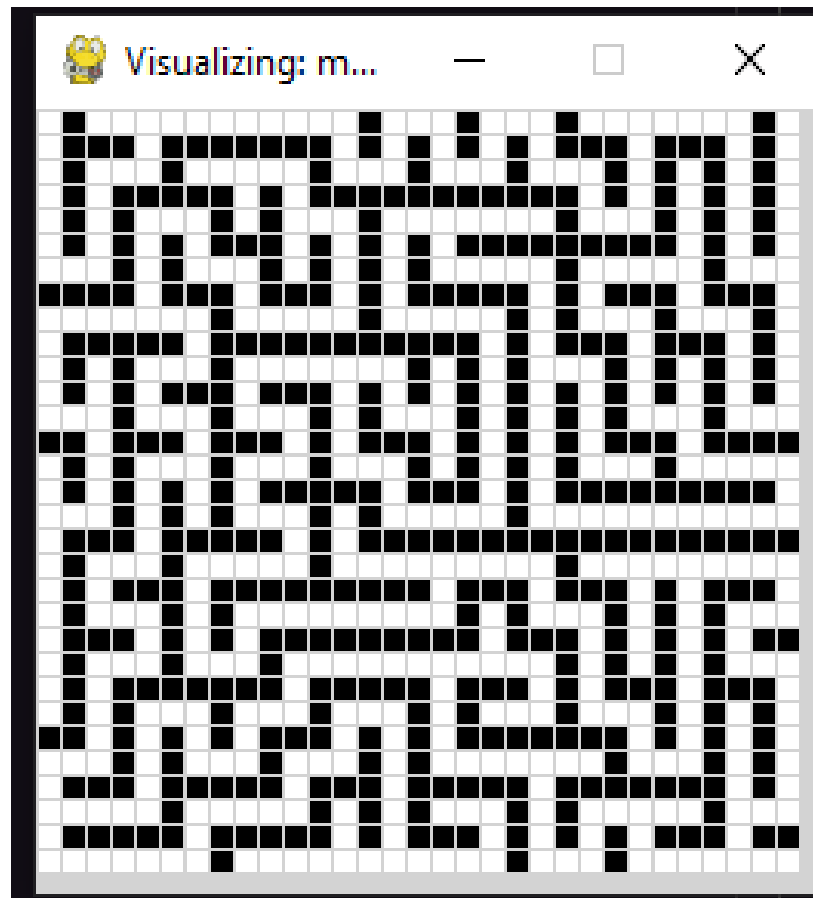
TEMPO: 15.713s

4 – TAMANHO ALTERADO

Parâmetros:

```
# initialize the grid array full of zeros
num_rows = 31
WINDOW_SIZE = [255, 255]
```
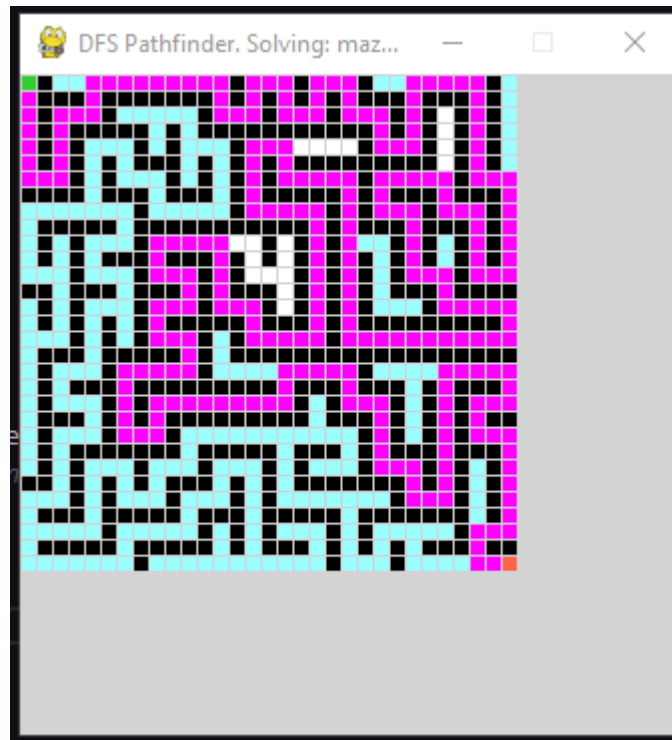
A*


```
PS C:\Users\gusth\Downloads\codigos\ai-maze-python-master> python aStar_pathfinder.py --maze_file=maze_0.csv --display=1
pygame 2.1.2 (SDL 2.0.18, Python 3.10.4)
Hello from the pygame community. https://www.pygame.org/contribute.html
--- finished 6.958 s---
```
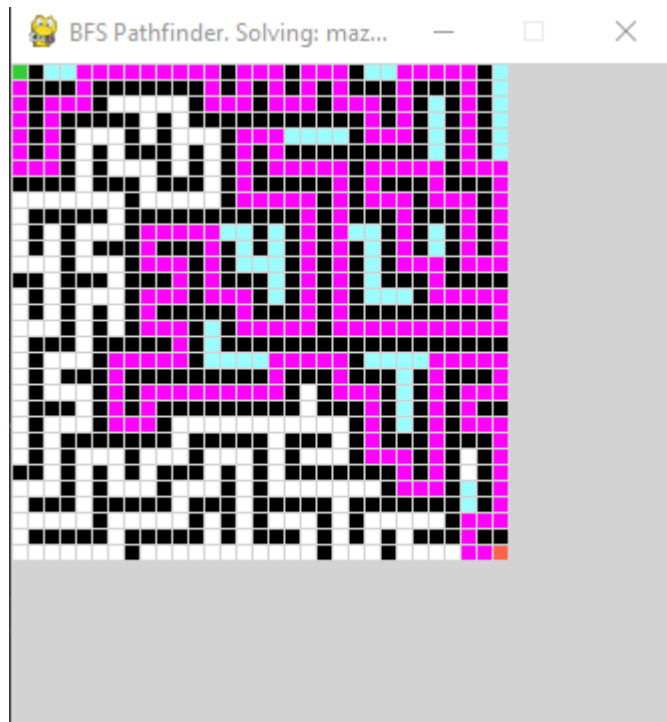
TEMPO: 6.958s

DFS (Busca por profundidade)

TEMPO: 10.273s

BFS (Busca por largura)


```
PS C:\Users\gusth\Downloads\codigos\ai-maze-python-master> python bfs_pathfinder.py --maze_file=maze_0.csv --display=1
pygame 2.1.2 (SDL 2.0.18, Python 3.10.4)
Hello from the pygame community. https://www.pygame.org/contribute.html
Solved! Click exit.
--- finished 6.796 s---
```

TEMPO: 6.796s

5 – ALTERANDO POSIÇÃO DE INÍCIO E FIM

```python
start_pos = (int(num_rows/2),(int(num_columns/2)))
goal_pos = (20,20)
```


Com essa alteração o labirinto é iniciado no meio da matriz e o objetivo é alcançar a linha 20 e coluna 20, optei por essas coordenadas pois outras opções pelo menos um dos três algoritmos não conseguia alcançar a solução, assim a coordenada (20.20) foi a primeira que funcionou para os três algoritmos.
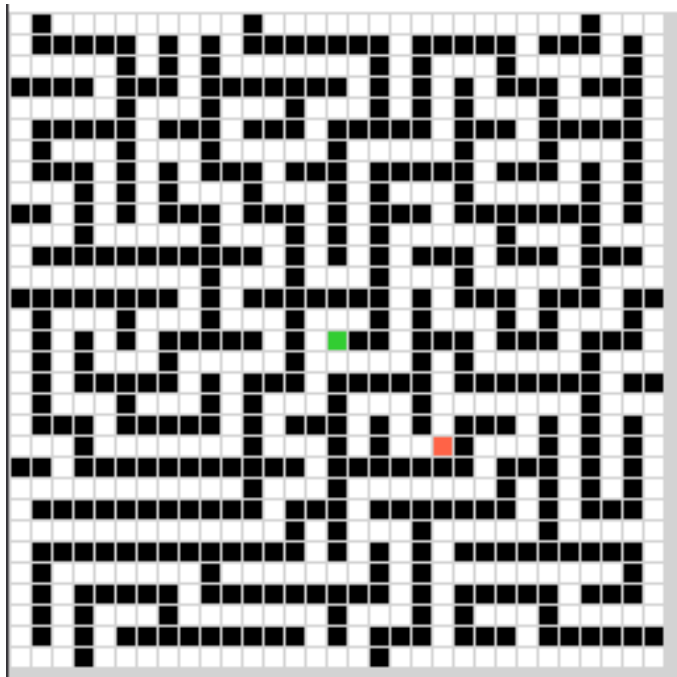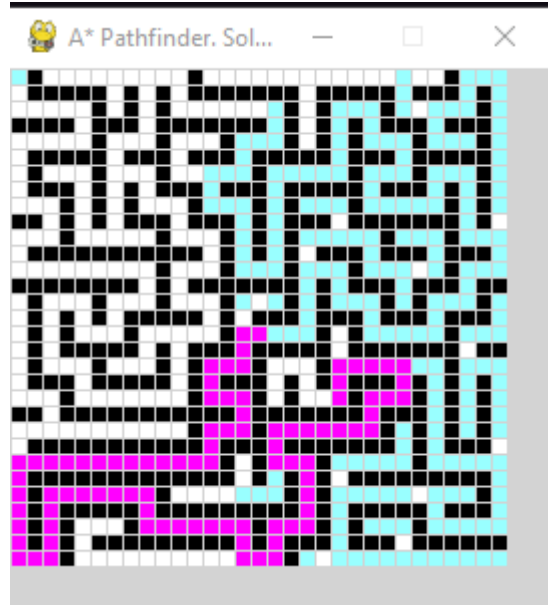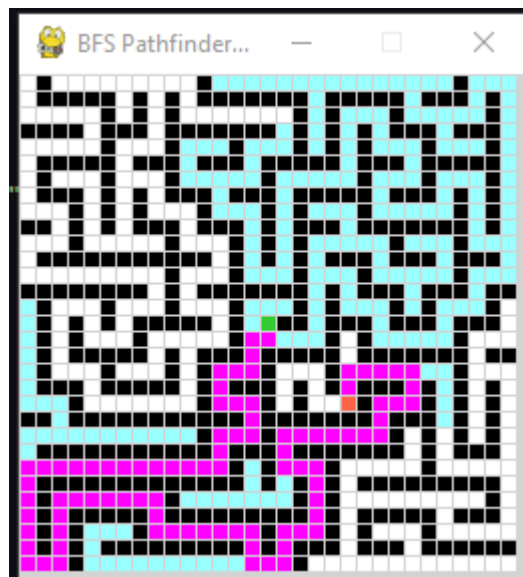
A*

```
PS C:\Users\gusth\Downloads\codigos\ai-maze-python-master> python aStar_pathfinder.py --maze_file=maze_0.csv --display=1
pygame 2.1.2 (SDL 2.0.18, Python 3.10.4)
Hello from the pygame community. https://www.pygame.org/contribute.html
--- finished 6.080 s---
```

TEMPO: 6.080s

BFS (Busca por largura)


```
PS C:\Users\gusth\Downloads\codigos\ai-maze-python-master> python bfs_pathfinder.py --maze_file=maze_0.csv --display=1
pygame 2.1.2 (SDL 2.0.18, Python 3.10.4)
Hello from the pygame community. https://www.pygame.org/contribute.html
Solved! Click exit.
--- finished 7.942 s---
```

TEMPO: 7.942s

DFS (Busca por profundidade)

```
finished 22.216 s
PS C:\Users\gusth\Downloads\codigos\ai-maze-python-master> python dfs_pathfinder.py --maze_file=maze_0.csv --display=1
pygame 2.1.2 (SDL 2.0.18, Python 3.10.4)
Hello from the pygame community. https://www.pygame.org/contribute.html
Solved! Click exit.
--- finished 7.653 s---
```

TEMPO: 7.653s

6 – CUSTO TOTAL (nós visitados)

A*

```
PS C:\Users\gusth\Downloads\codigos\ai-maze-python-master> python aStar_pathfinder.py --maze_file=maze_0.csv --disp
pygame 2.1.2 (SDL 2.0.18, Python 3.10.4)
Hello from the pygame community. https://www.pygame.org/contribute.html
Numeros de nos visitados:  301
```

Número de nós: 301

BFS (Busca por largura)

```
PS C:\Users\gusth\Downloads\codigos\ai-maze-python-master> python bfs_pathfinder.py --maze_file=maze_0.csv --display=1
pygame 2.1.2 (SDL 2.0.18, Python 3.10.4)
Hello from the pygame community. https://www.pygame.org/contribute.html
Solved! Click exit.
Nos visitados:  435
```

Número de nós: 435

DFS (Busca por profundidade)

```
PS C:\Users\gusth\Downloads\codigos\ai-maze-python-master> python dfs_pathfinder.py --maze_file=maze_0.csv --display=1
pygame 2.1.2 (SDL 2.0.18, Python 3.10.4)
Hello from the pygame community. https://www.pygame.org/contribute.html
Solved! Click exit.
Nos visitados:  448
```

Número de nós: 448

7 – FUNÇÃO DE CUSTO NA BUSCA A*

```python
def compute_node_cost(pos, goal):
    """
    Parameters
    ----------
    pos : tuple of 2 ints
        position of node whos cost want to compute.
    goal : tuple of 2 ints
        position of goal.
    Returns
    -------
    cost : float
        euclidean distance pos-goal
    """
    x, y = pos
    x_goal, y_goal = goal
    cost = np.sqrt((x_goal-x)**2 + (y_goal-y)**2)
    return cost
```
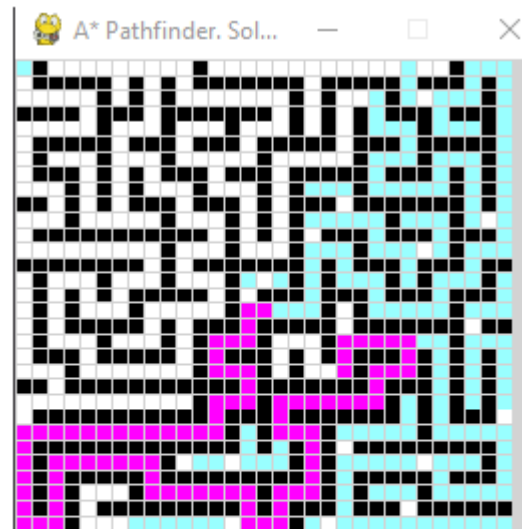
8 –IMPLEMENTAR DISTÂNCIA CITY BLOCK NA BUSCA A*

```python
def compute_node_cost(pos, goal):
    result = np.sum([abs(a - b) for (a, b) in zip(pos, goal)])
    return result
```


PADRÃO

DISTANCIA CITY BLOCK

DIFERENÇA DE TEMPO E CUSTO TOTAL

CITY BLOCK

```
PS C:\Users\gusth\Downloads\codigos\ai-maze-python-master> python aStar_pathfinder.py --maze_file=maze_0.csv --display=1
pygame 2.1.2 (SDL 2.0.18, Python 3.10.4)
Hello from the pygame community. https://www.pygame.org/contribute.html
Numeros de nos visitados:  279
--- finished 5.420 s---
```

TEMPO: 5.420s

NÓS VISITADOS: 279

PADRÃO

```
PS C:\Users\gusth\Downloads\codigos\ai-maze-python-master> python aStar_pathfinder.py --maze_file=maze_0.csv --display=1
pygame 2.1.2 (SDL 2.0.18, Python 3.10.4)
Hello from the pygame community. https://www.pygame.org/contribute.html
Numeros de nos visitados:  301
--- finished 5.786 s---
```

TEMPO: 5.786s

NÓS VISITADOS: 301