Assignmant01 – Maze Game 결과보고서

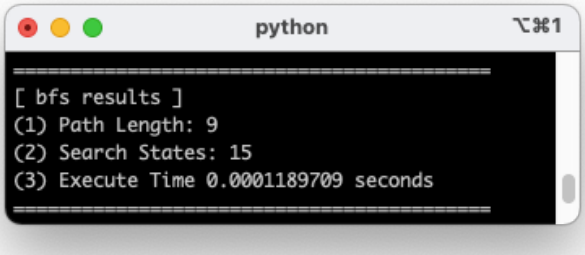
전공: 컴퓨터공학 학년: 3학년 학번: 20171602 이름: 강지혁

1. Stage 1

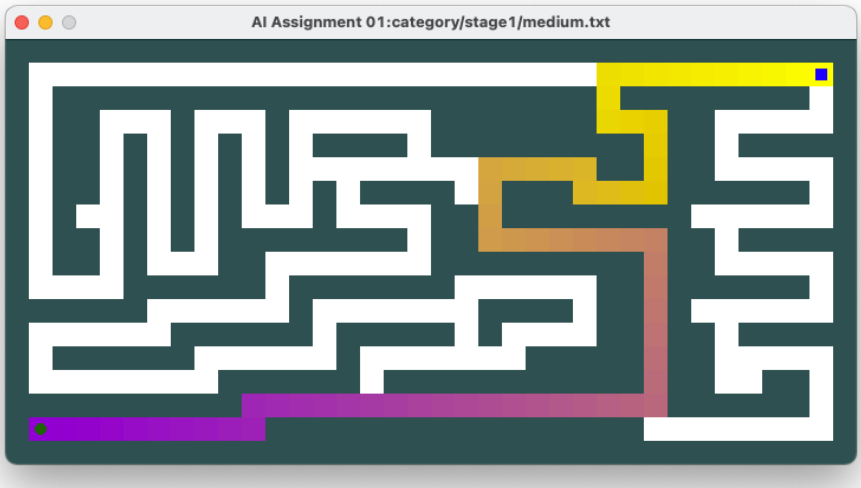
1.1 BFS algorithm

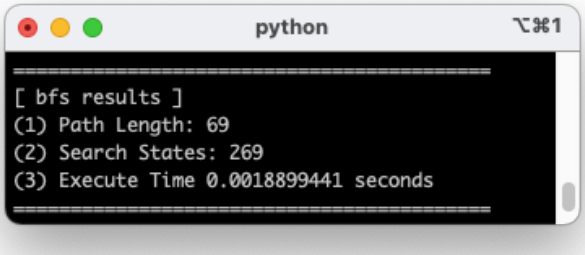
1차원 리스트인 bfsQueue를 선언하여 방문할 노드를 insert, 방문한 노드를 delete 해 가며 isObjective 값이 True가 될 때까지 너비 우선 탐색을 수행하는 알고리즘이다. isObjective가 True가 되면 경로를 path 리스트에 저장하고 return한다.

A. small.txt --method bfs

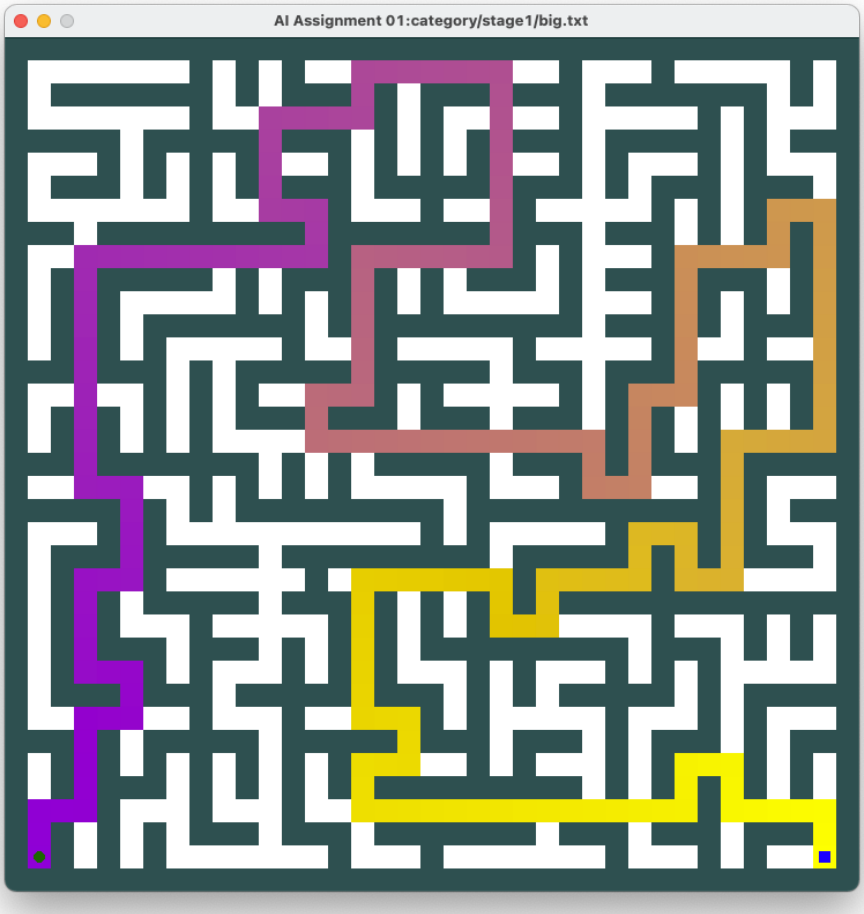


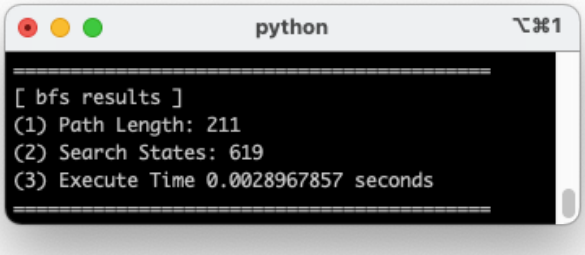
B. medium.txt --method bfs





C. big.txt --method bfs

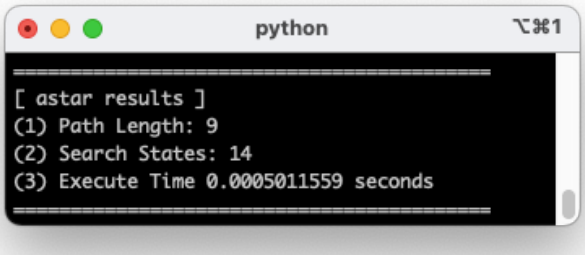




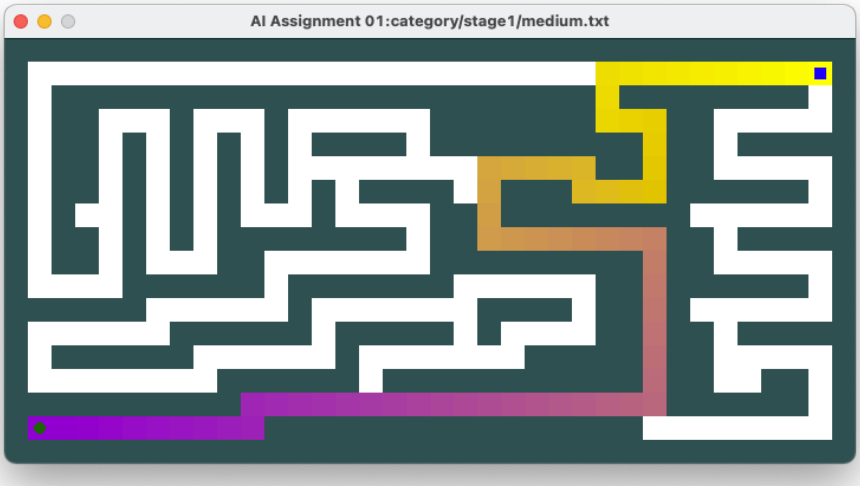
1.2 A* algorithm

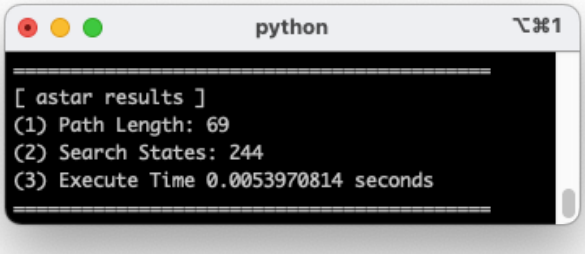
지금까지 진행한 거리와 남은 거리의 Manhattan Distance 값의 합을 F로 하는 Heuristic Function을 사용한 A* 알고리즘이다. loop를 순회할 때마다 방문하지 않은 neighbor를 탐색하며 neighbor 중에서 Heuristic Function 값이 가장 작은 node를 경로로 선택한다.

A. small.txt --method astar

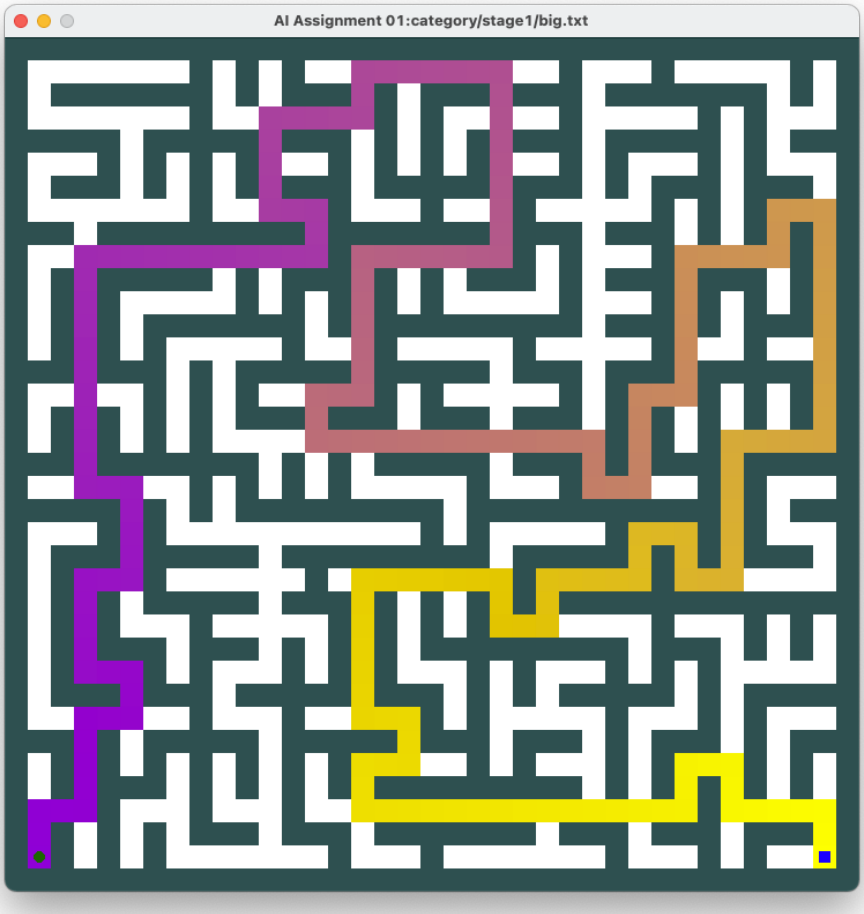


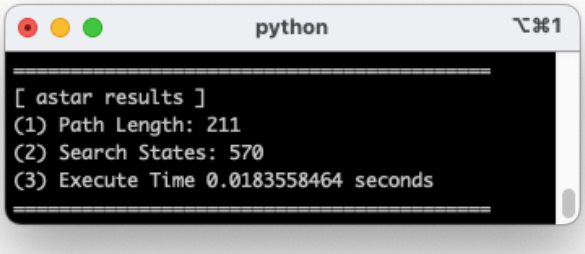
B. medium.txt --method astar





C. big.txt --method astar

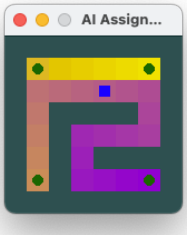


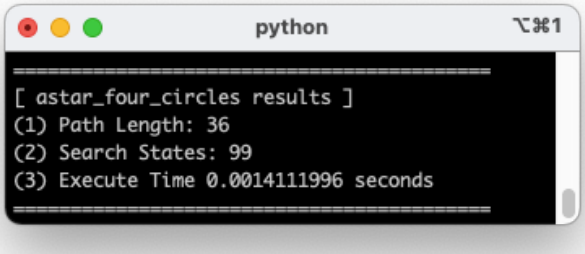


2. Stage 2

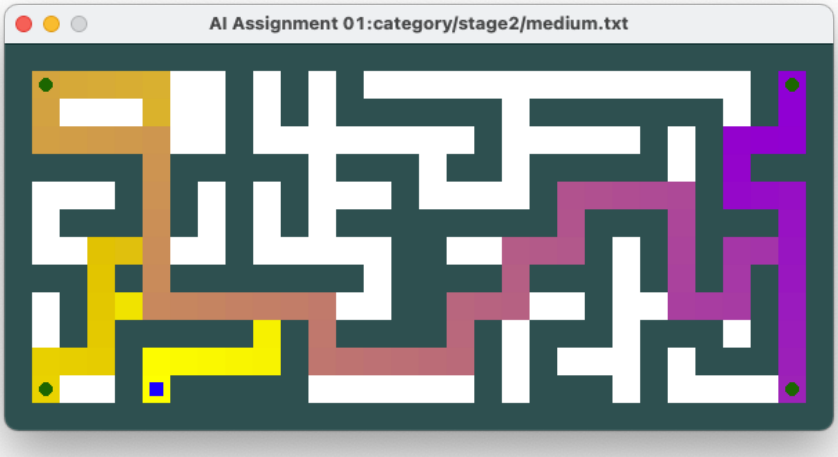
   Agent의 현재 위치로부터 네 모서리의 end_points까지 Manhattan Distance 값 중 최솟값과 지금까지 진행한 거리의 합을 F로 하는 Heuristic Function을 사용한 A* 알고리즘이다. loop를 순회할 때마다 방문하지 않은 neighbor를 탐색하며 neighbor 중에서 Heuristic Function 값이 가장 작은 node를 경로로 선택한다. 특정 end_point에 도착하면 모든 end_points를 찾았는지 확인하고 아직 남은 end_point가 있으면 지금까지의 경로를 저장하고 다시 진행한다.

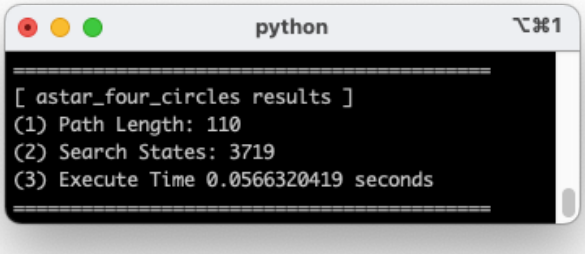
A. small.txt --method astar_four_circles



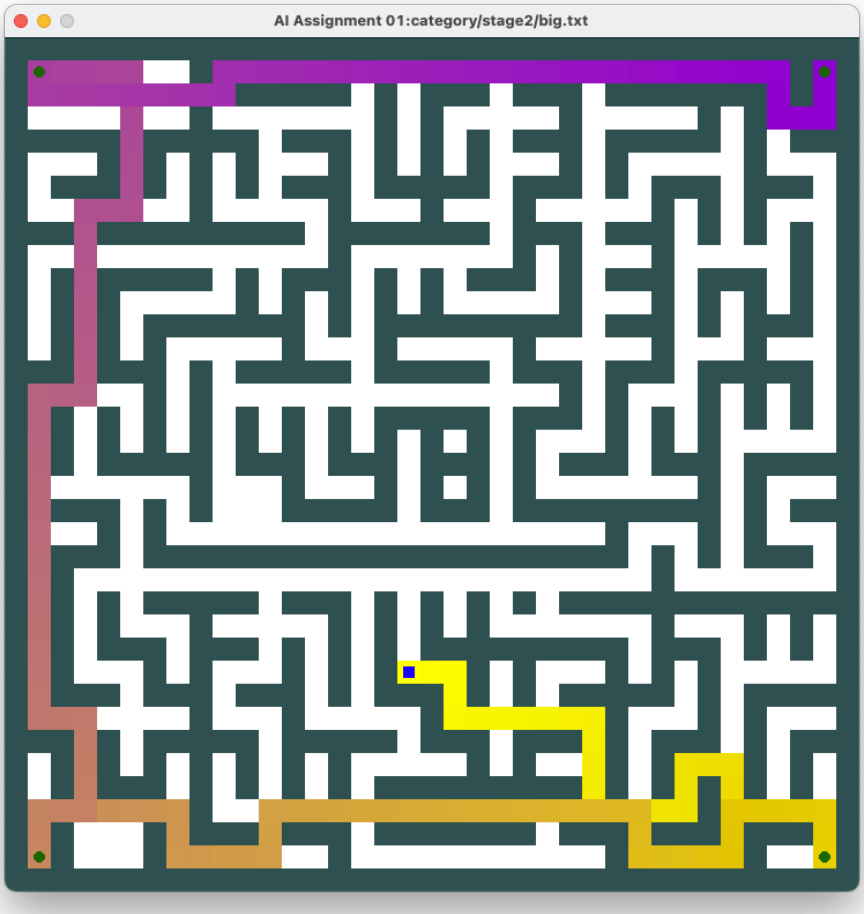


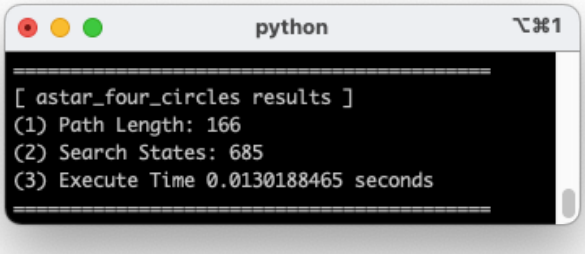
B. medium.txt --method astar_four_circles





C. big.txt --method astar_four_circles

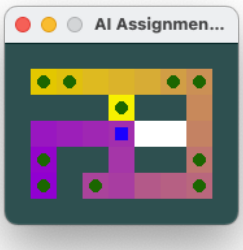


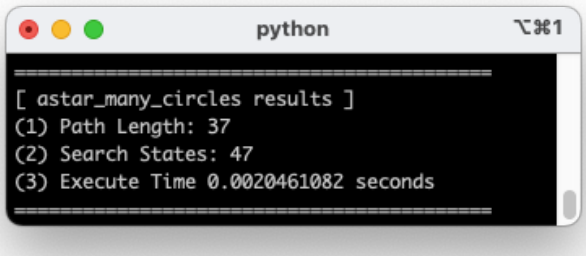


3. Stage 3

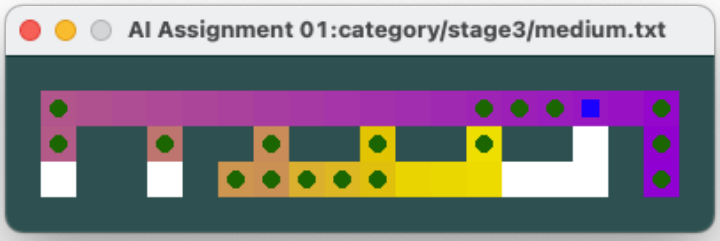
   Minimum Spanning Tree을 이용한 Heuristic Function을 구현하지 못해 Stage 2에서 사용한 Heuristic Function을 이용해 A* 알고리즘을 구현하였다. Agent의 현재 위치로부터 모든 end_points까지 Manhattan Distance 값 중 최솟값과 지금까지 진행한 거리의 합을 F로 사용한다. loop를 순회할 때마다 방문하지 않은 neighbor를 탐색하며 neighbor 중에서 Heuristic Function 값이 가장 작은 node를 경로로 선택한다. 특정 end_point에 도착하면 남은 end_points가 존재하는지 확인하고 아직 남은 end_point가 있으면 지금까지의 경로를 저장하고 다시 진행한다.

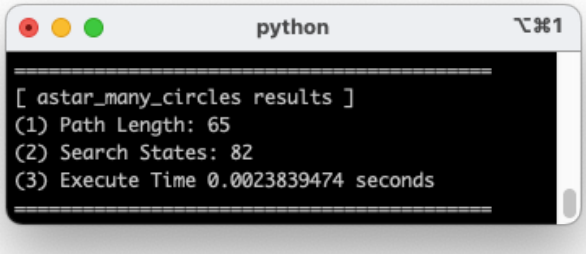
A. small.txt --method astar_many_circles



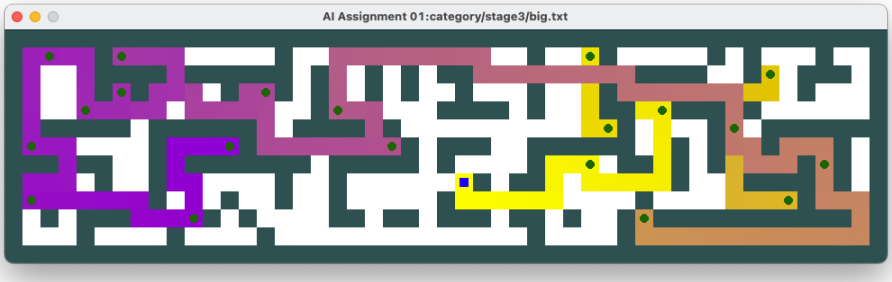


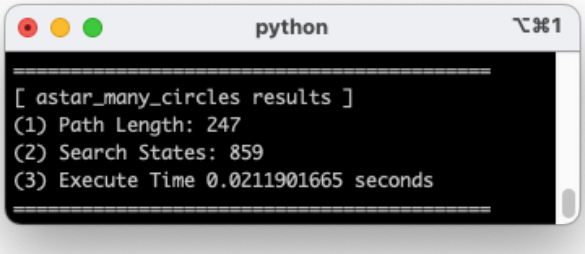
B. medium.txt --method astar_many_circles





C. big.txt --method astar_many_circles


AI Assignment 01:category/stage3/big.txt


python
⌥⌘1
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[astar_many_circles results]
(1) Path Length: 247
(2) Search States: 859
(3) Execute Time 0.0211901665 seconds
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