Week 3: Group 1

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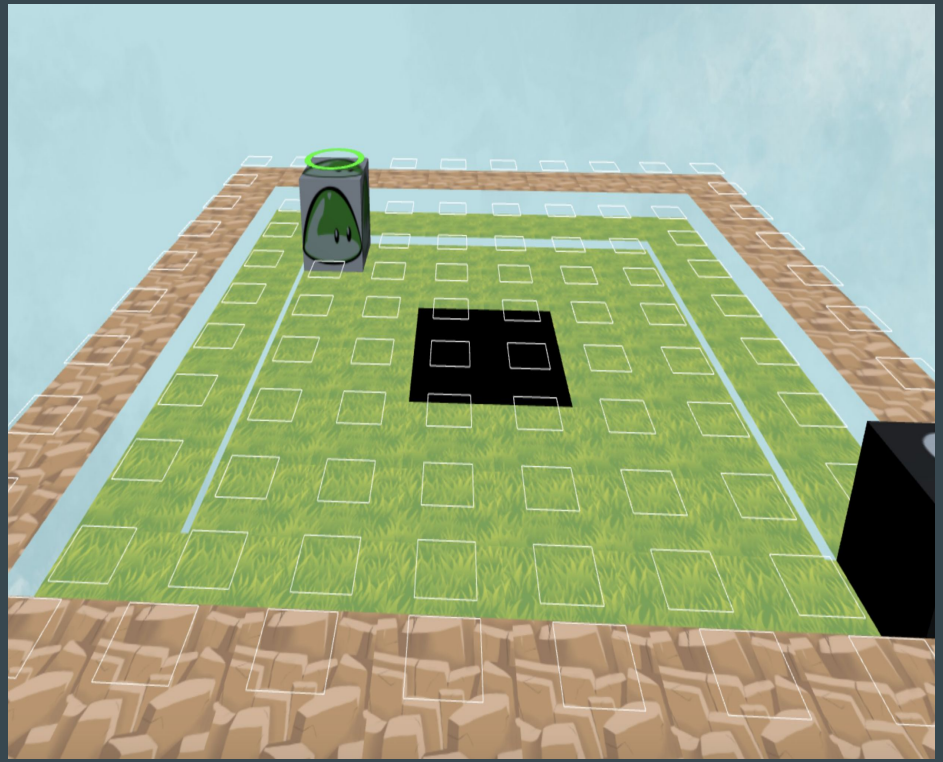
Our Tasks

- Added heights to terrain generation
- Added 3D geometry to terrain generation
- Refactored classes for Object-Oriented approach
- Researched A* for pathing capabilities

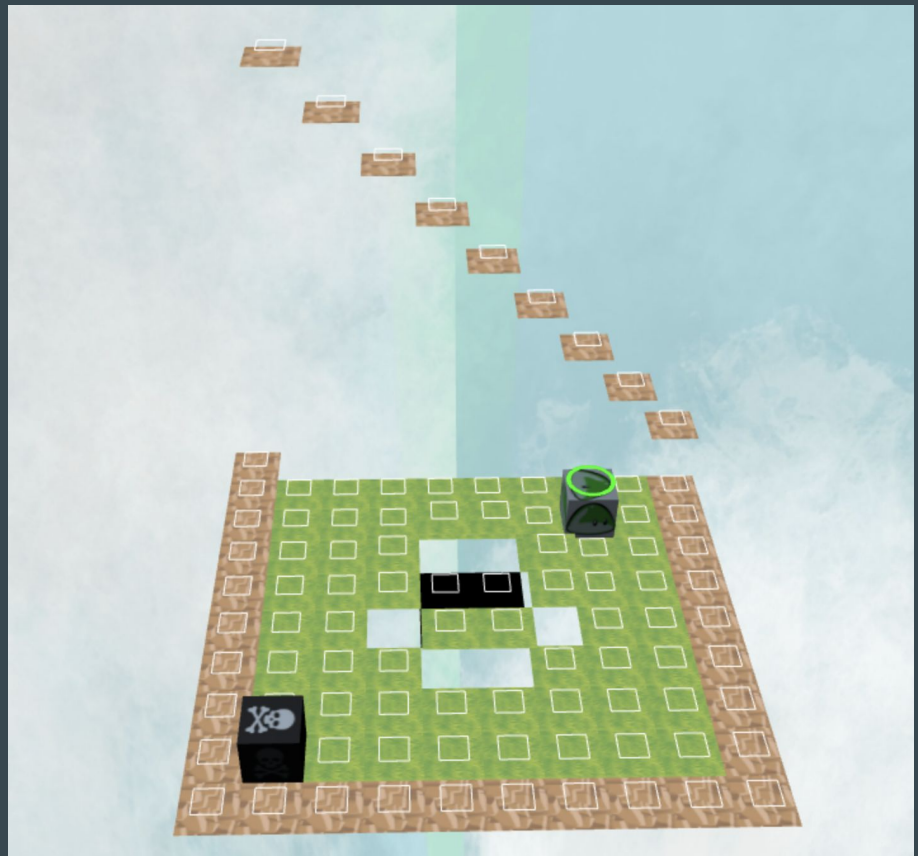
New Grid Generation

- Our Playing field now takes heights into account.
- Our grid matrix is now accompanied by a height map which generate terrain types and heights simultaneously.



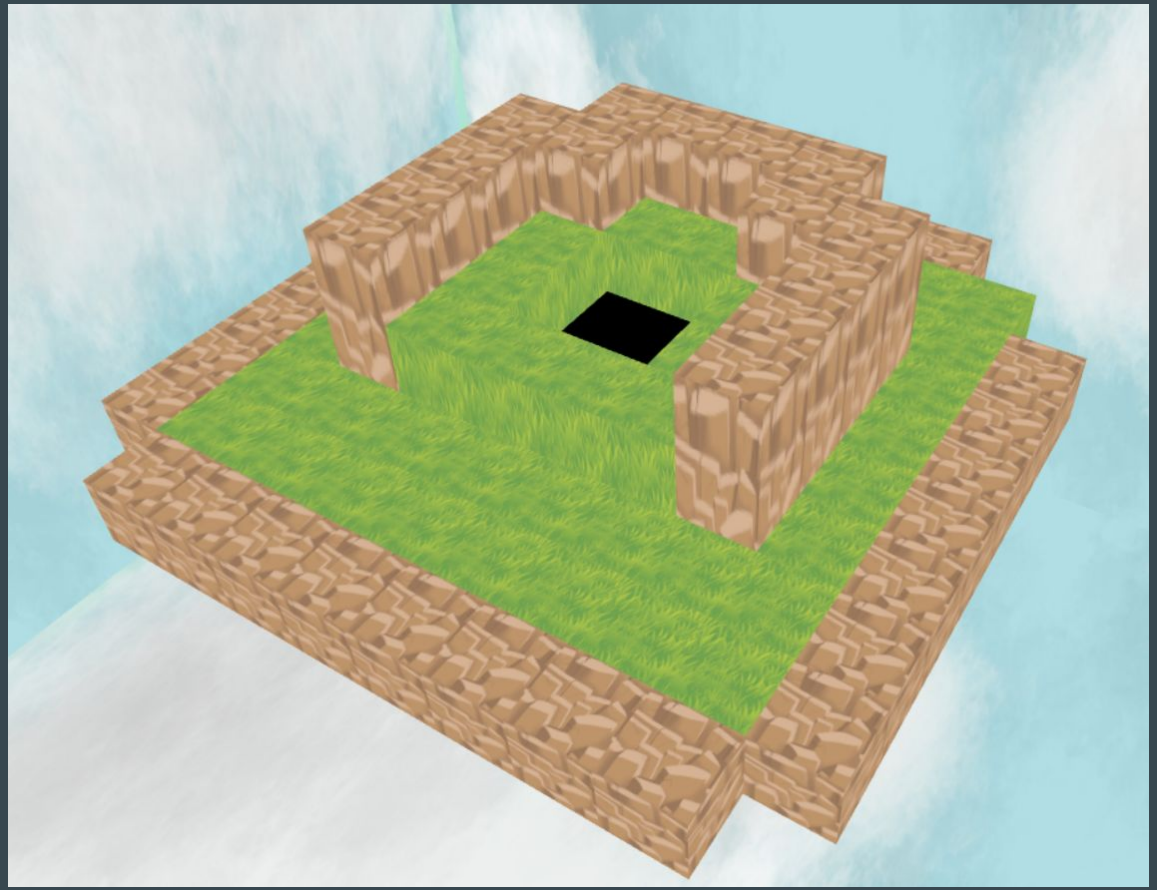
Heights

- With proper height scaling:



Heights(cont.)

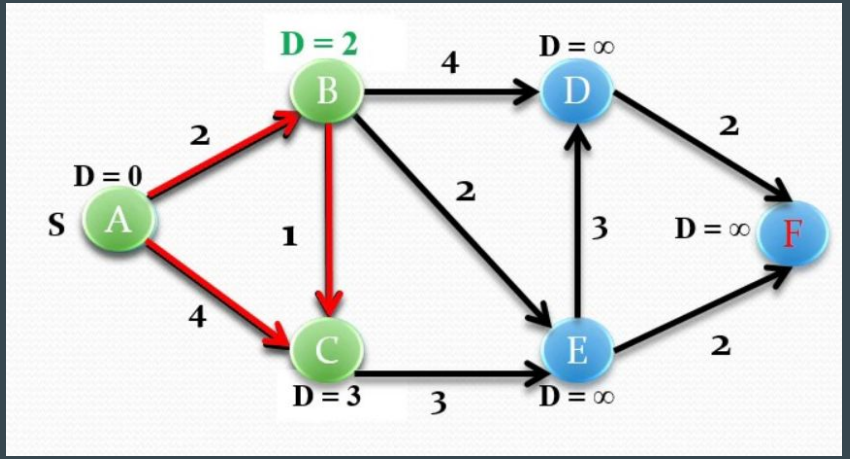
- Adding 3D Geometry:



A*

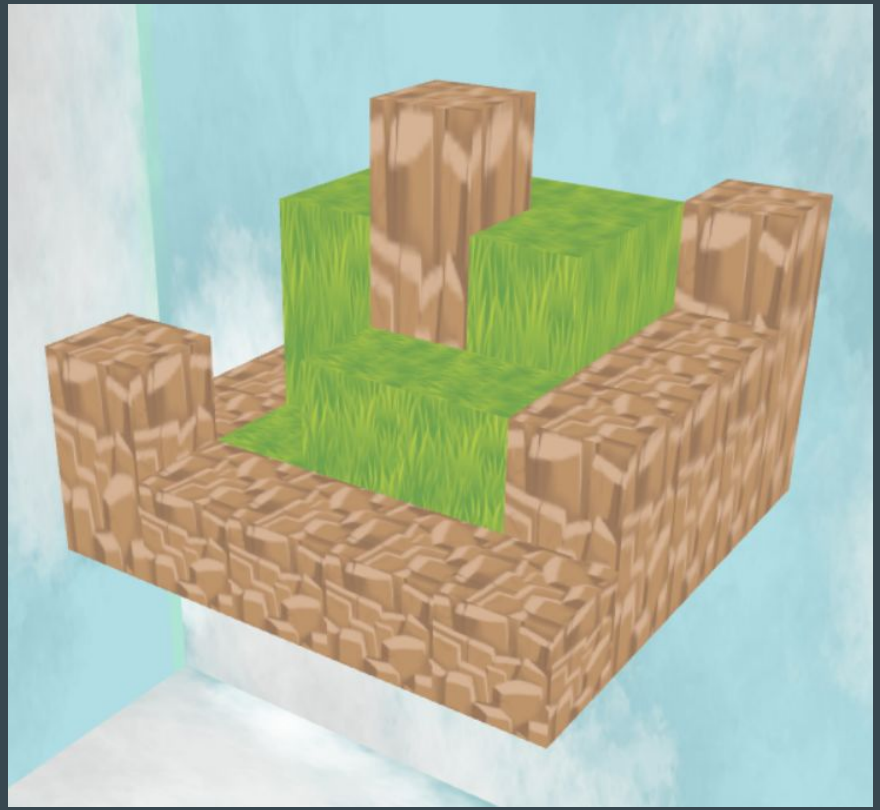
-A* (A-Star) is a pathfinding Algorithm based on Dijkstra's Algorithm

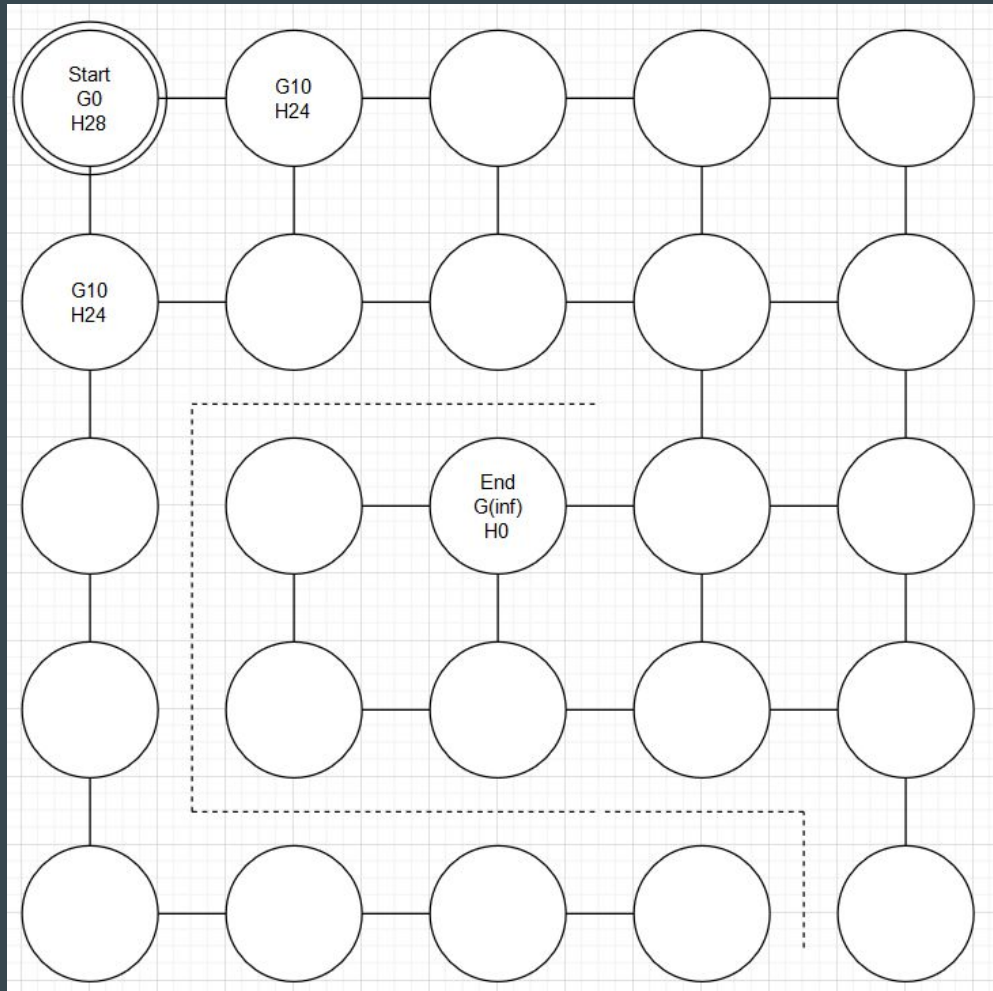
-Dijkstra's Algorithm is a "greedy algorithm" that calculates node distances from the start node.



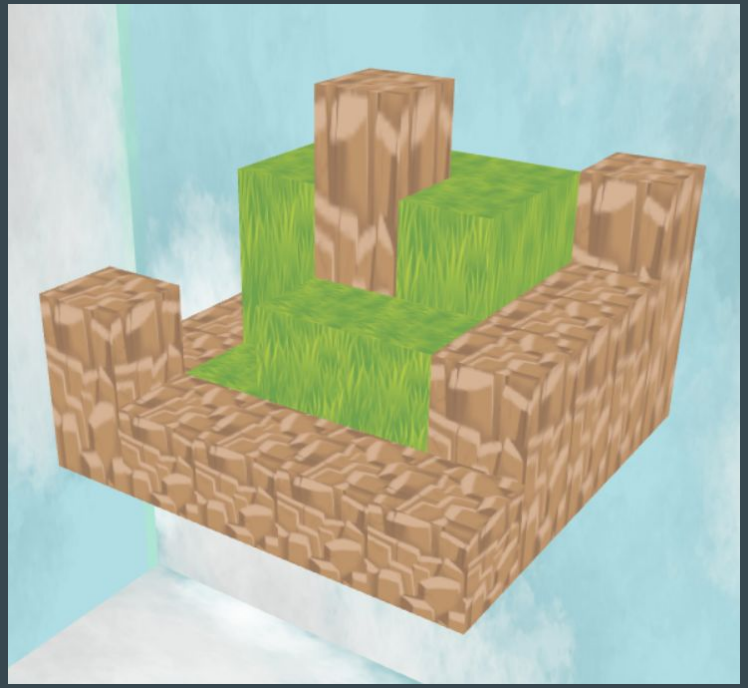
Dijkstra's Algorithm

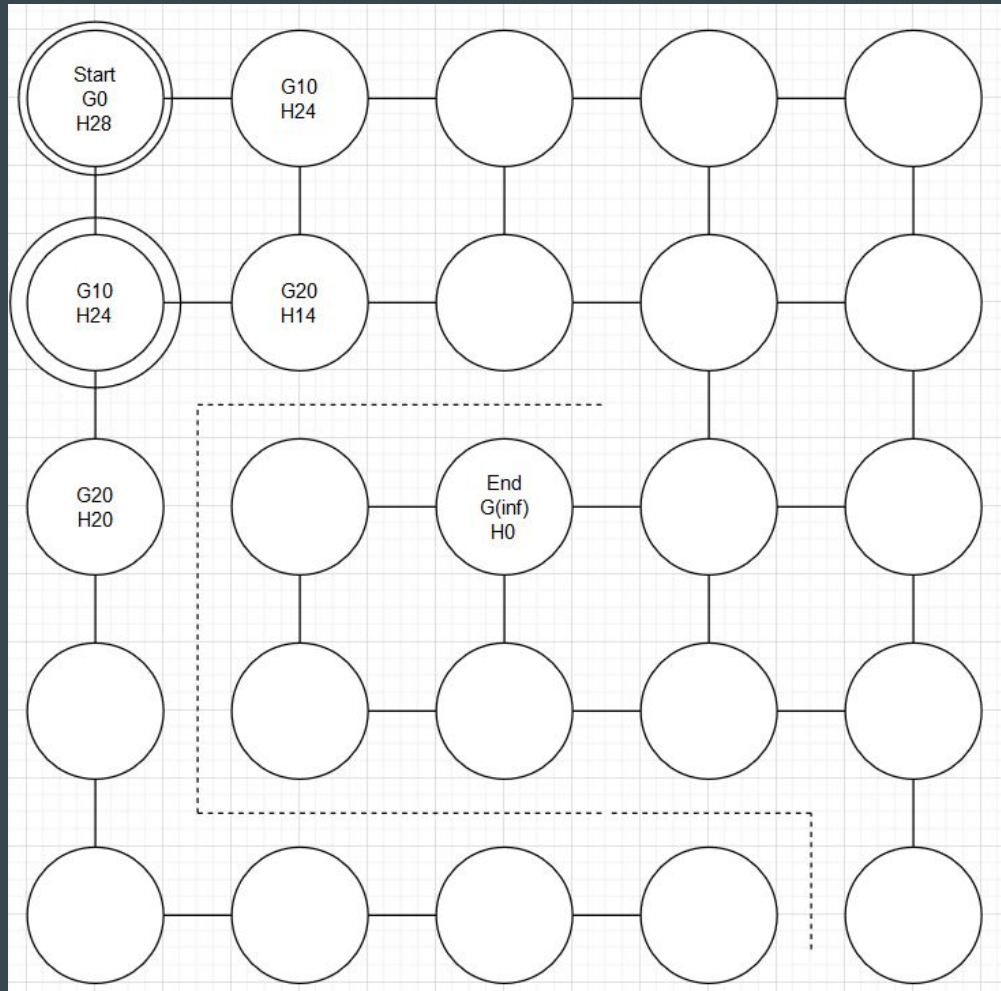
A* (cont.)



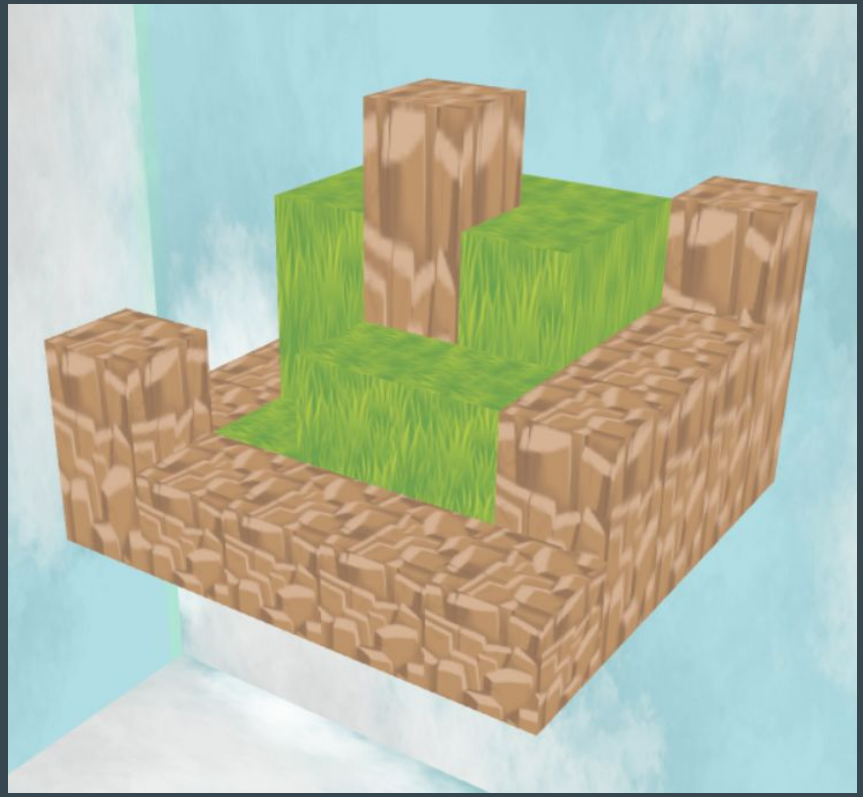


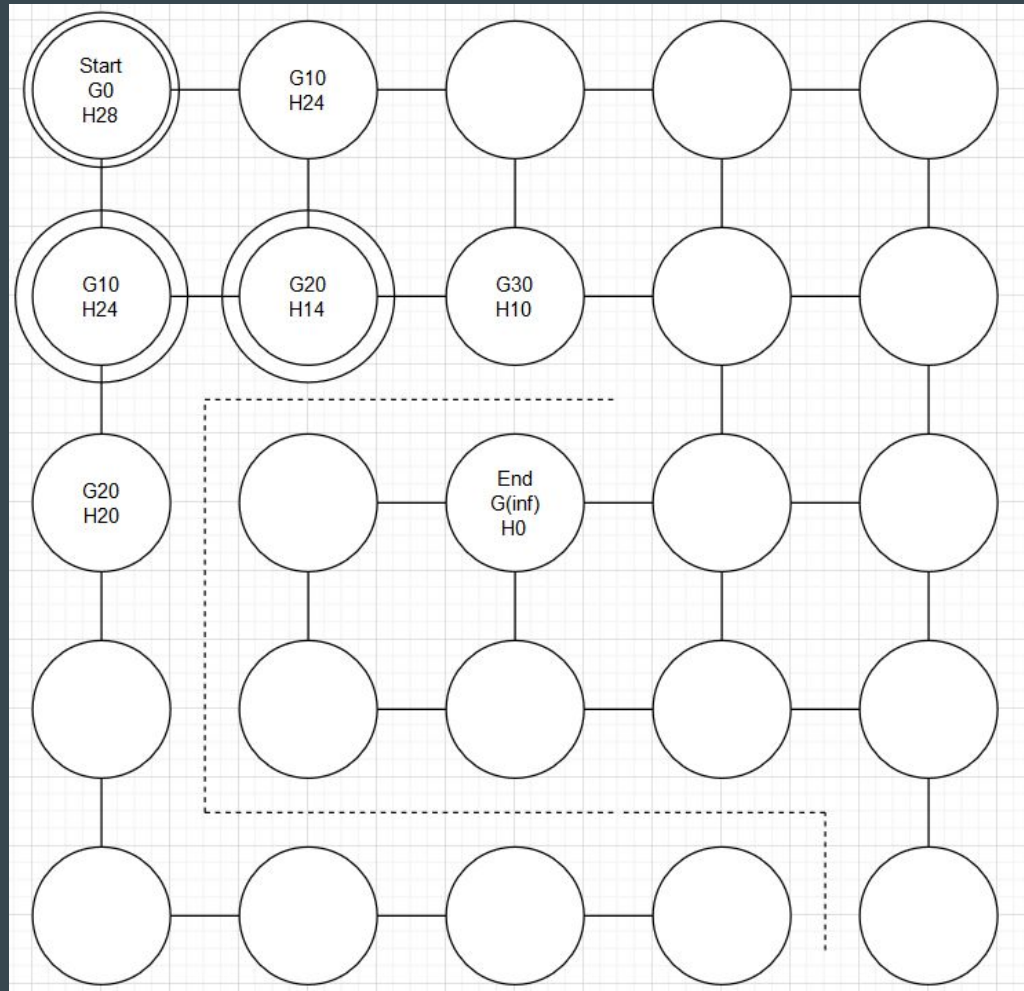
A* (cont.)



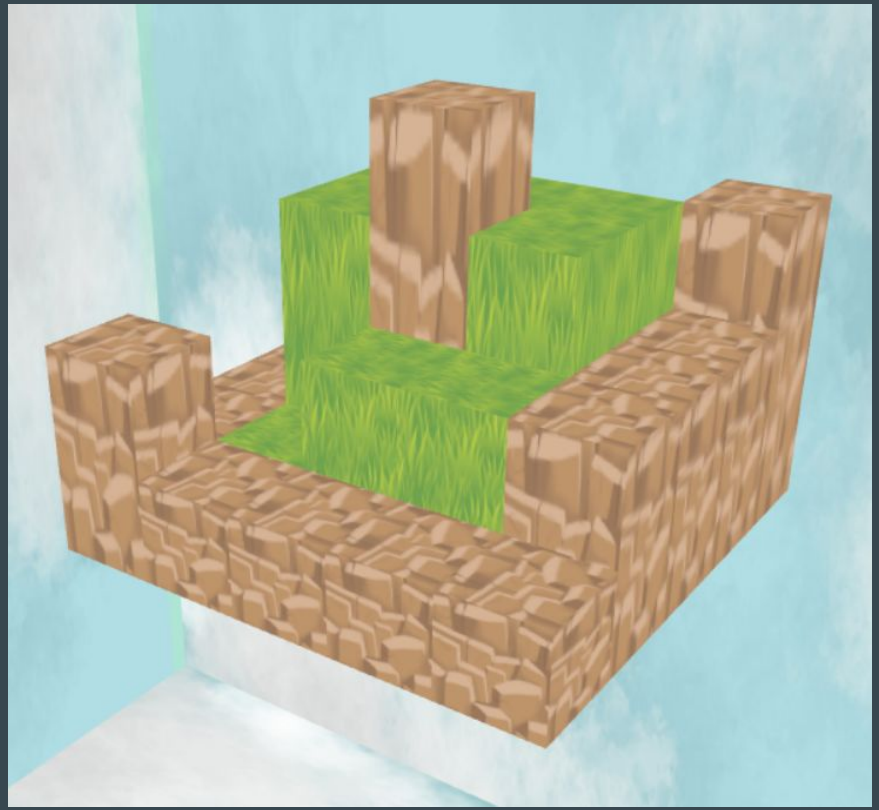


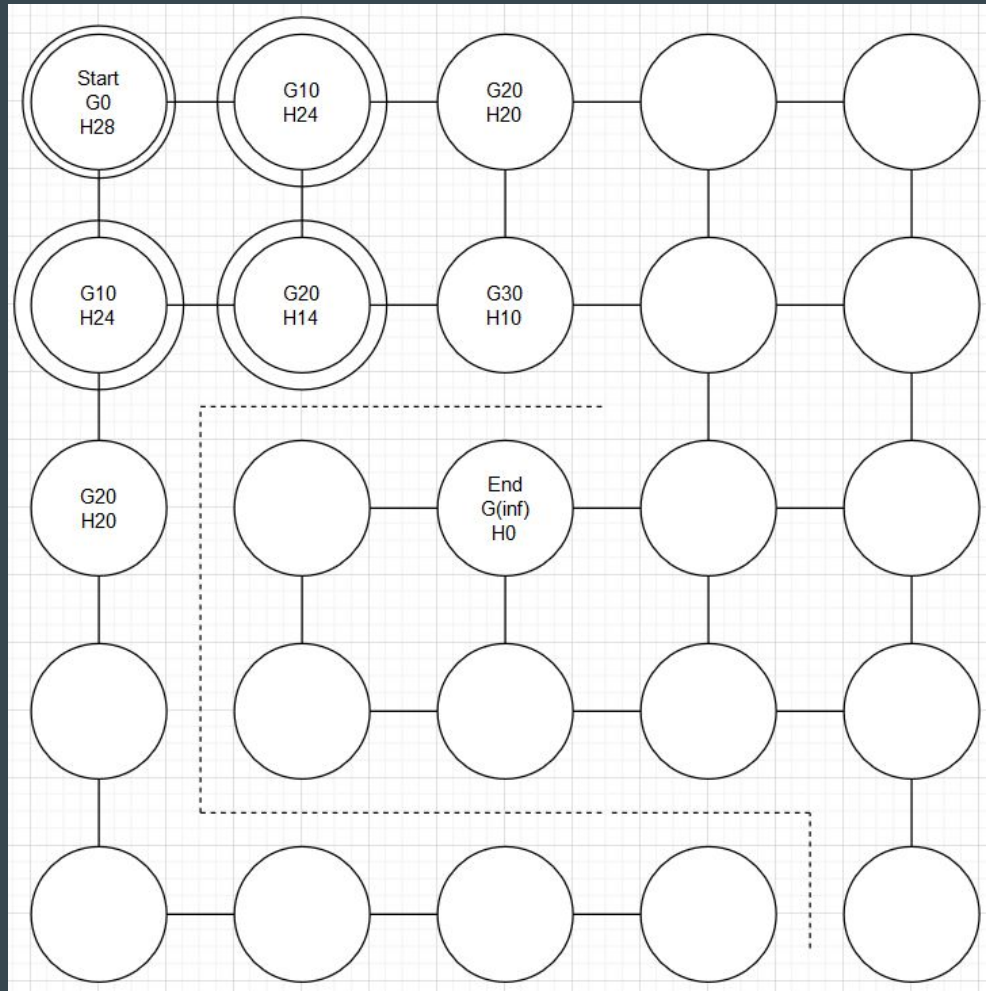
A* (cont.)



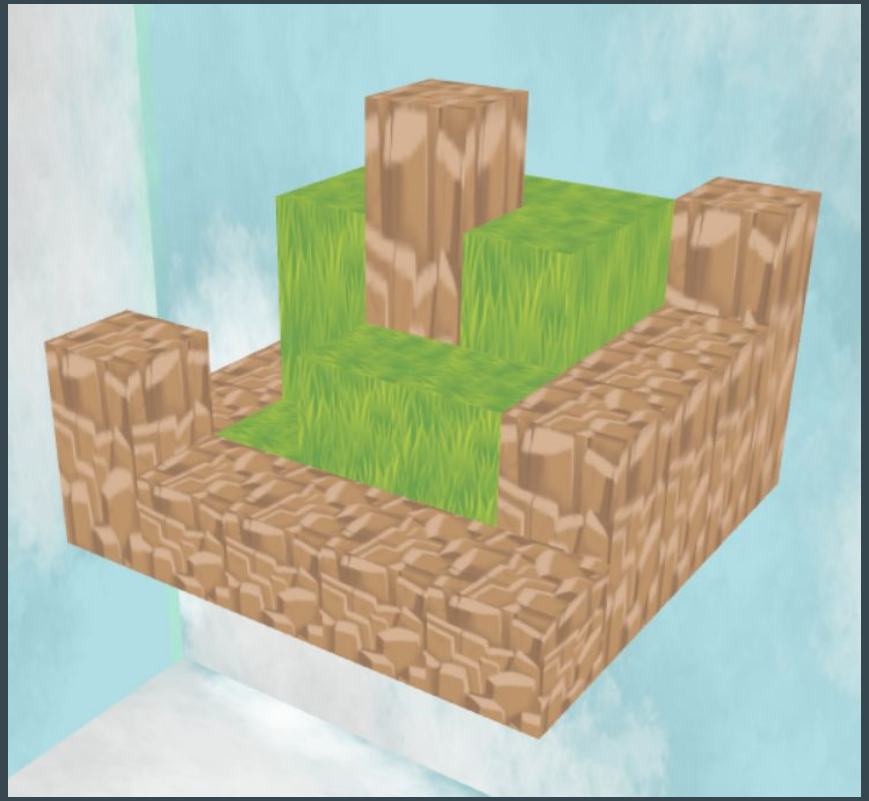


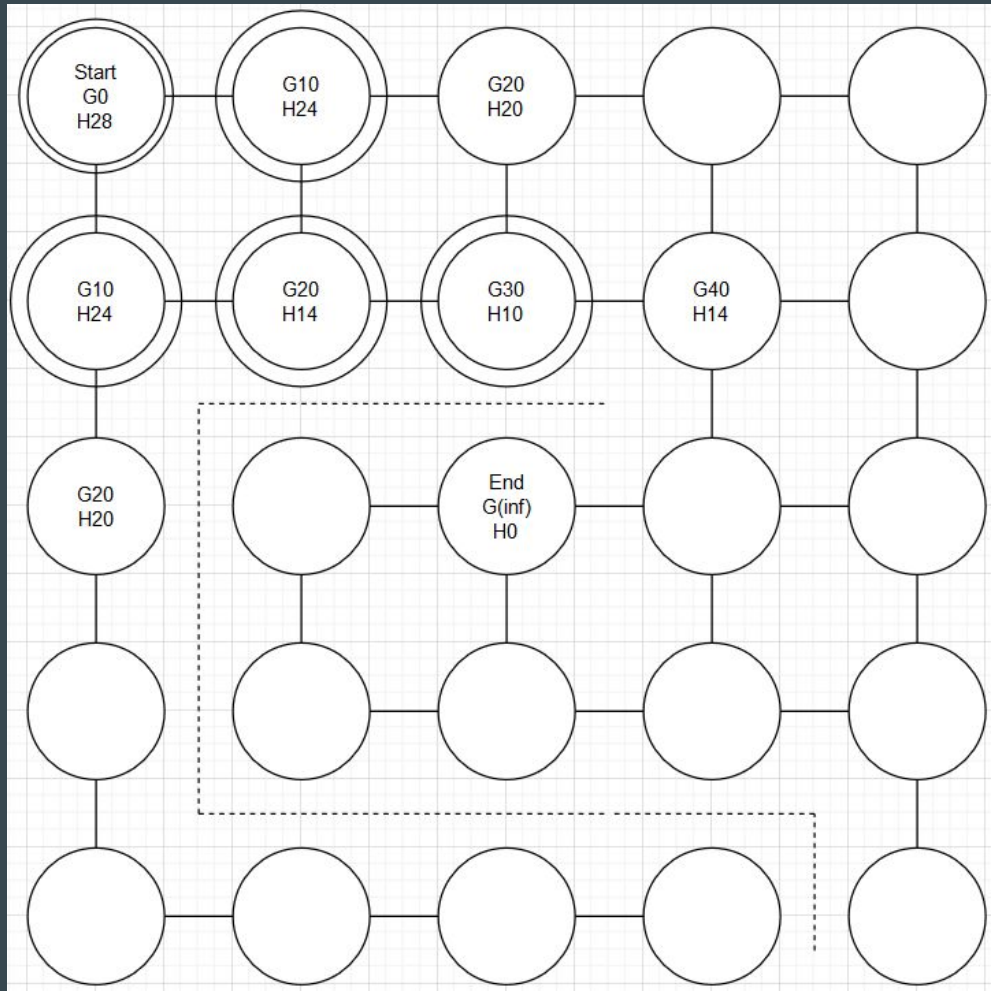
A* (cont.)



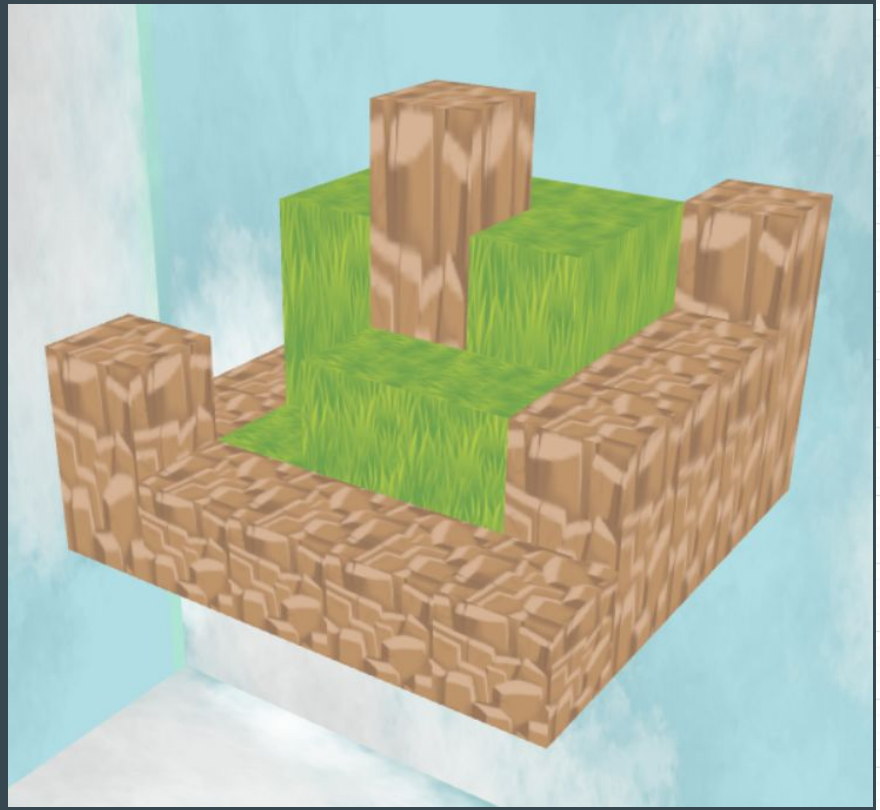

Start
G0
H28
G10
H24
G20
H20
G10
H24
G20
H14
G30
H10
G20
H20
End
G(inf)
H0

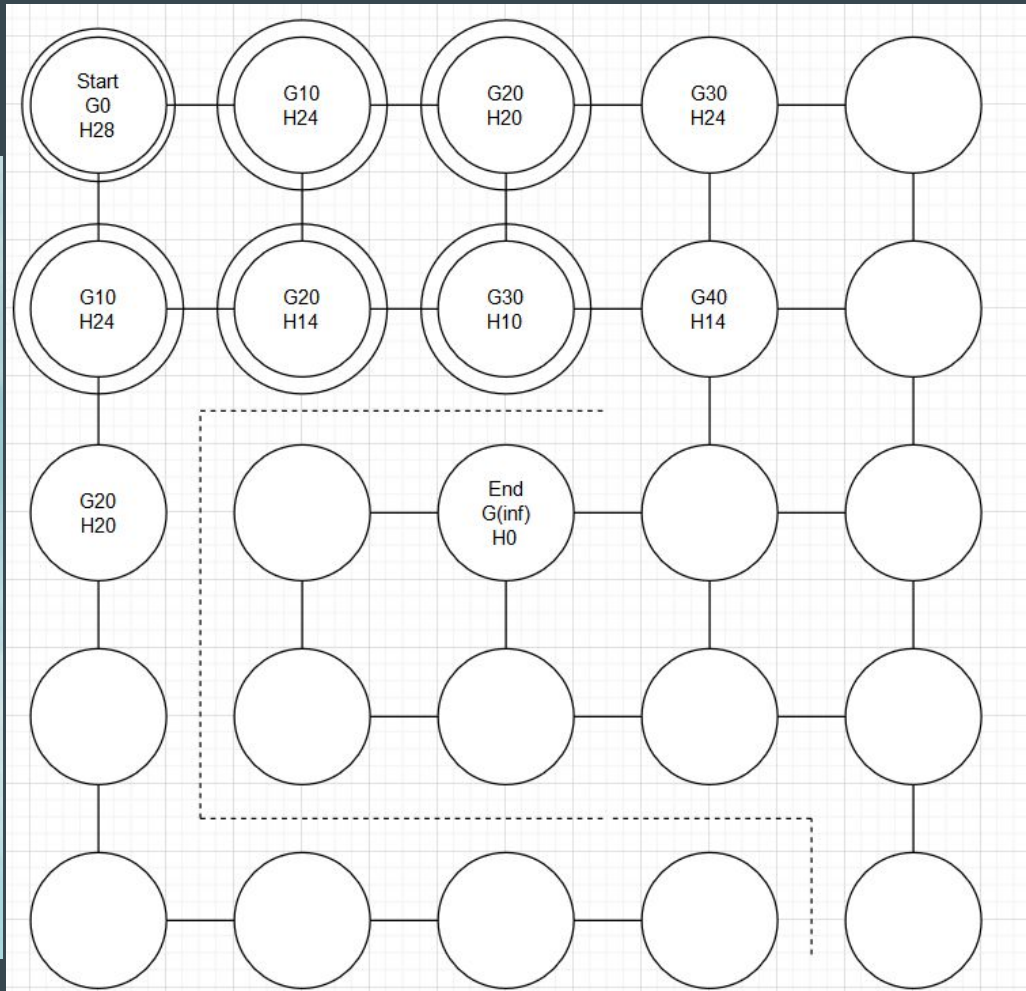
A* (cont.)




Start
G0
H28
G10
H24
G20
H20
G10
H24
G20
H14
G30
H10
G40
H14
G20
H20
End
G(inf)
H0

A* (cont.)




Start
G0
H28
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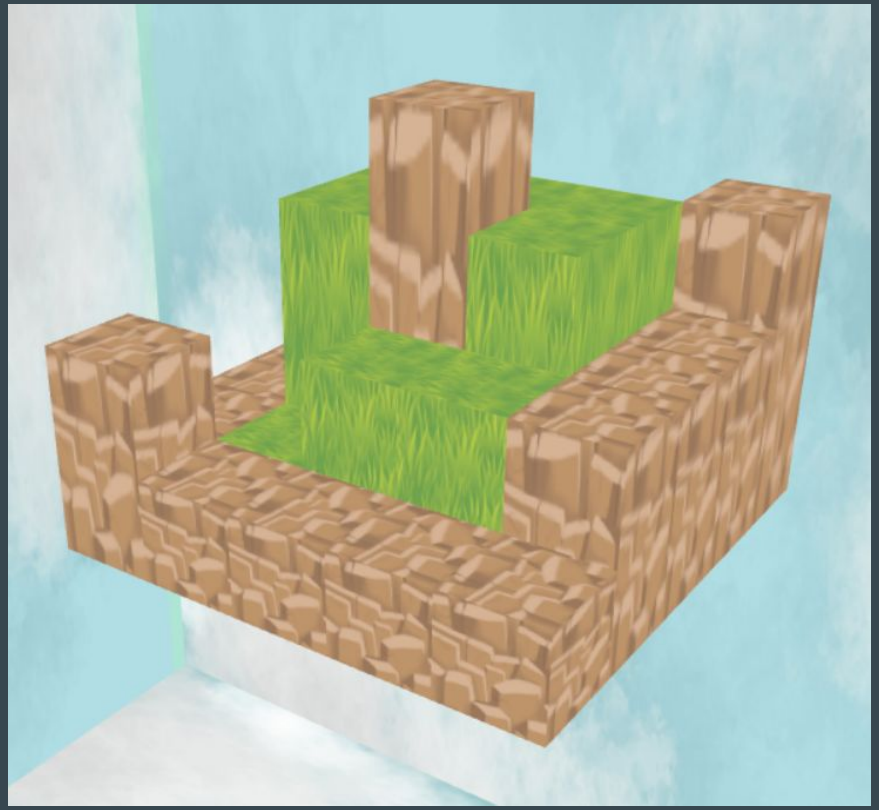
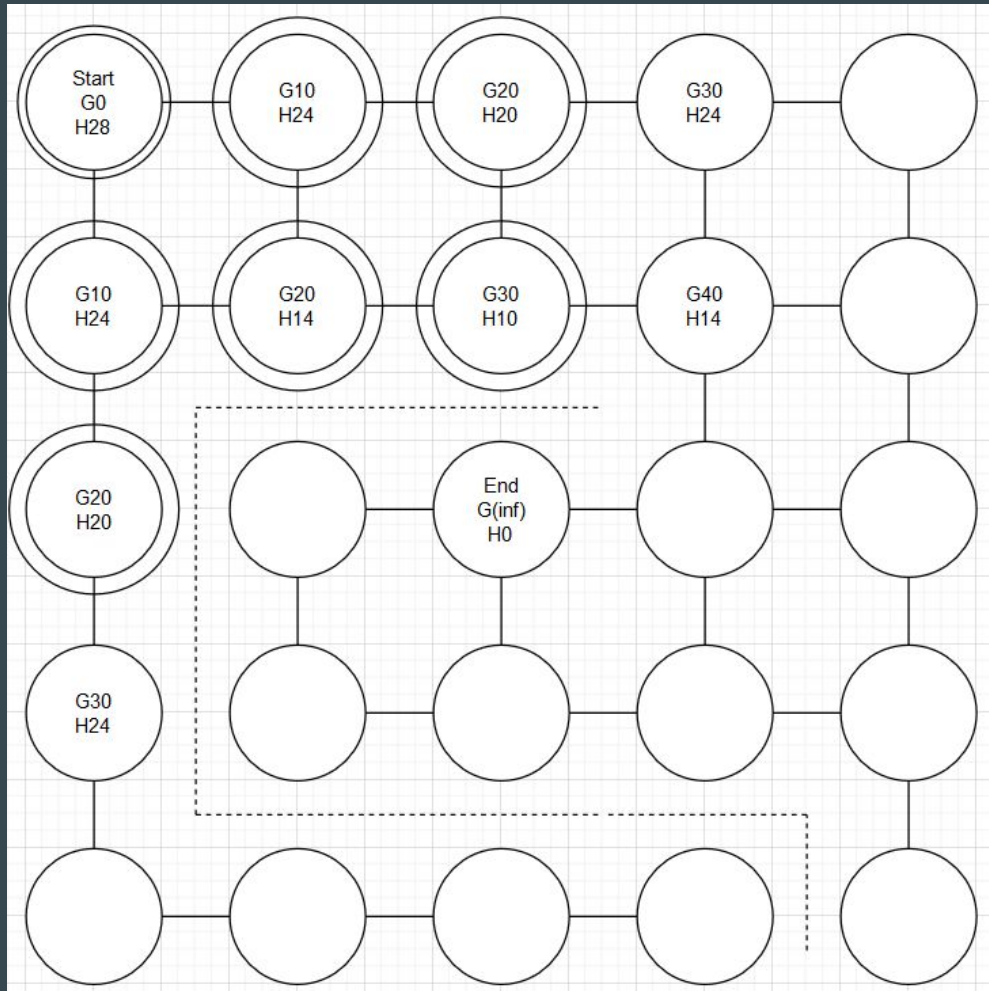
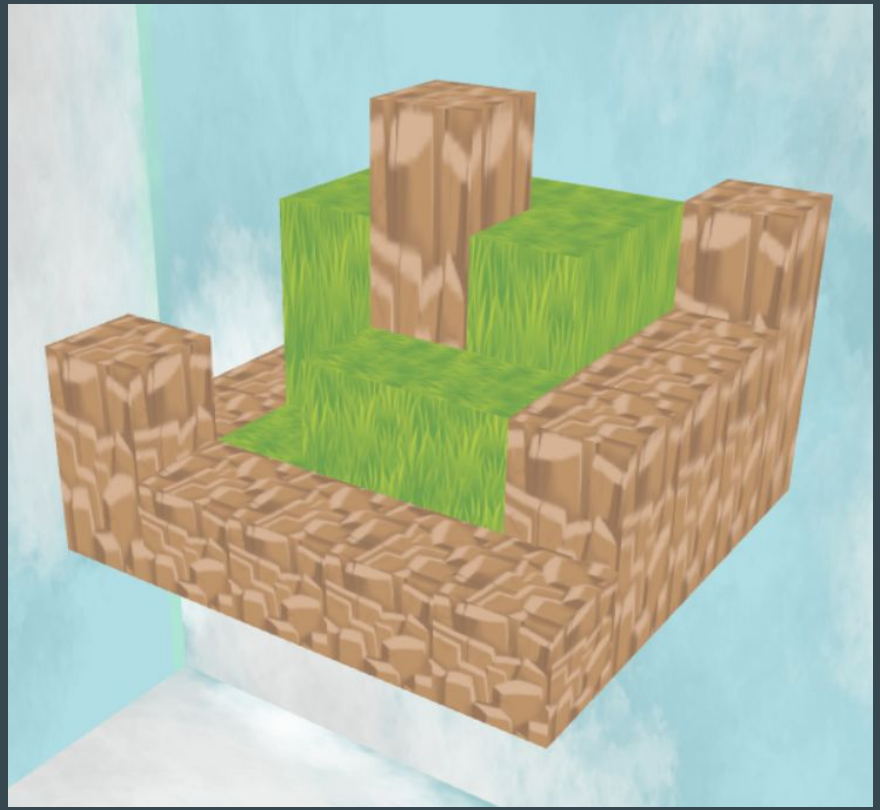
H24
G20
H20
G30
H24
G10
H24
G20
H14
G30
H10
G40
H14
G20
H20
End
G(inf)
H0

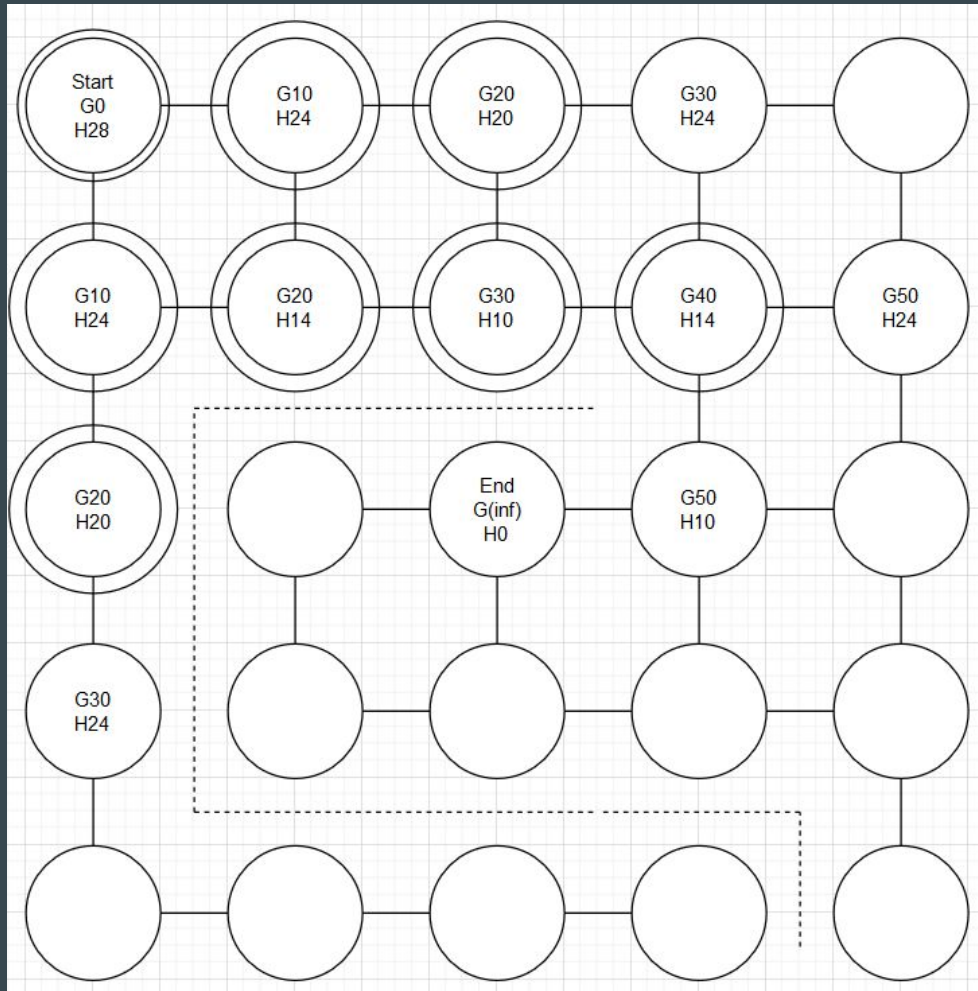
A* (cont.)




Start
G0
H28
G10
H24
G20
H20
G30
H24
G10
H24
G20
H14
G30
H10
G40
H14
G20
H20
End
G(inf)
H0
G30
H24

A* (cont.)




Start
G0
H28
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H24
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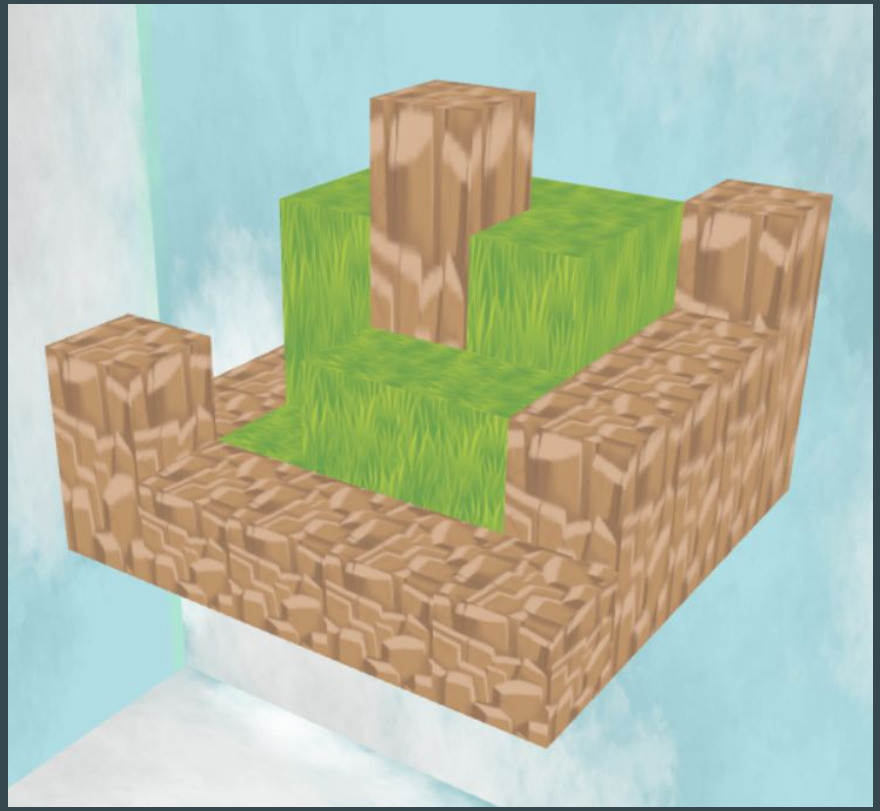
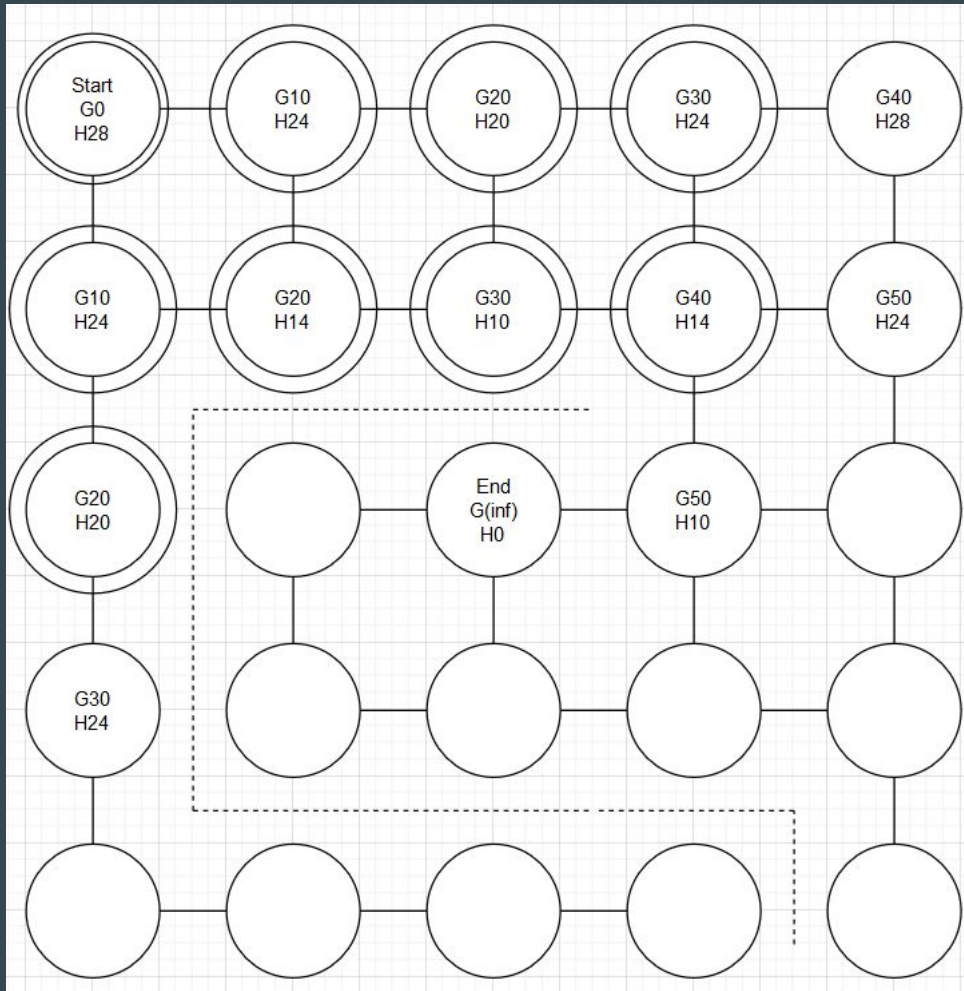
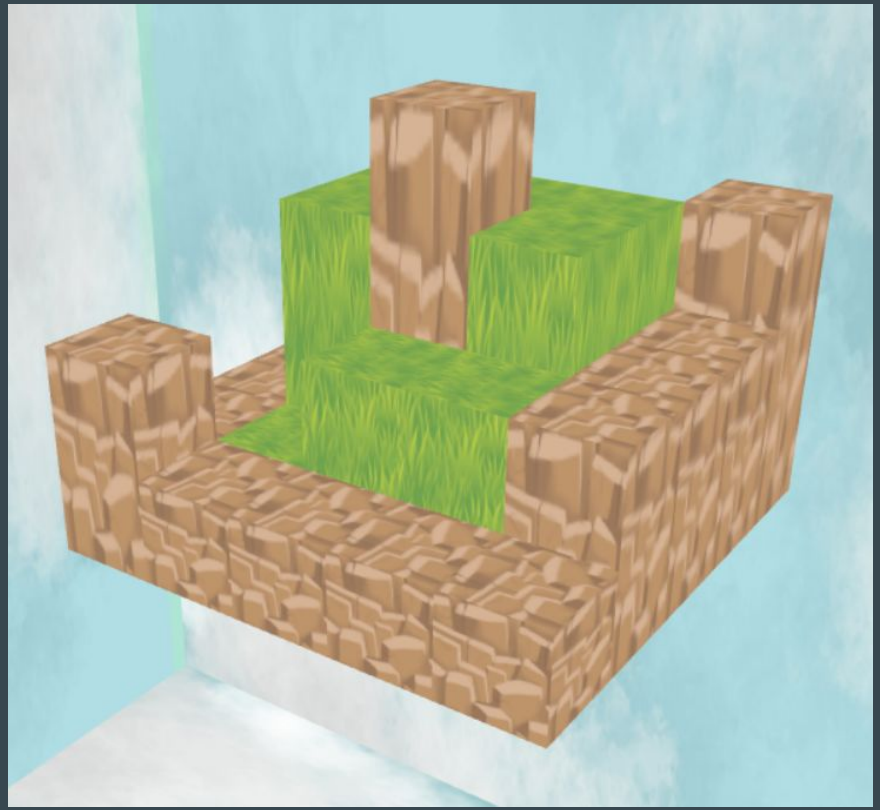
H20
G30
H24
G10
H24
G20
H14
G30
H10
G40
H14
G50
H24
G20
H20
End
G(inf)
H0
G50
H10
G30
H24

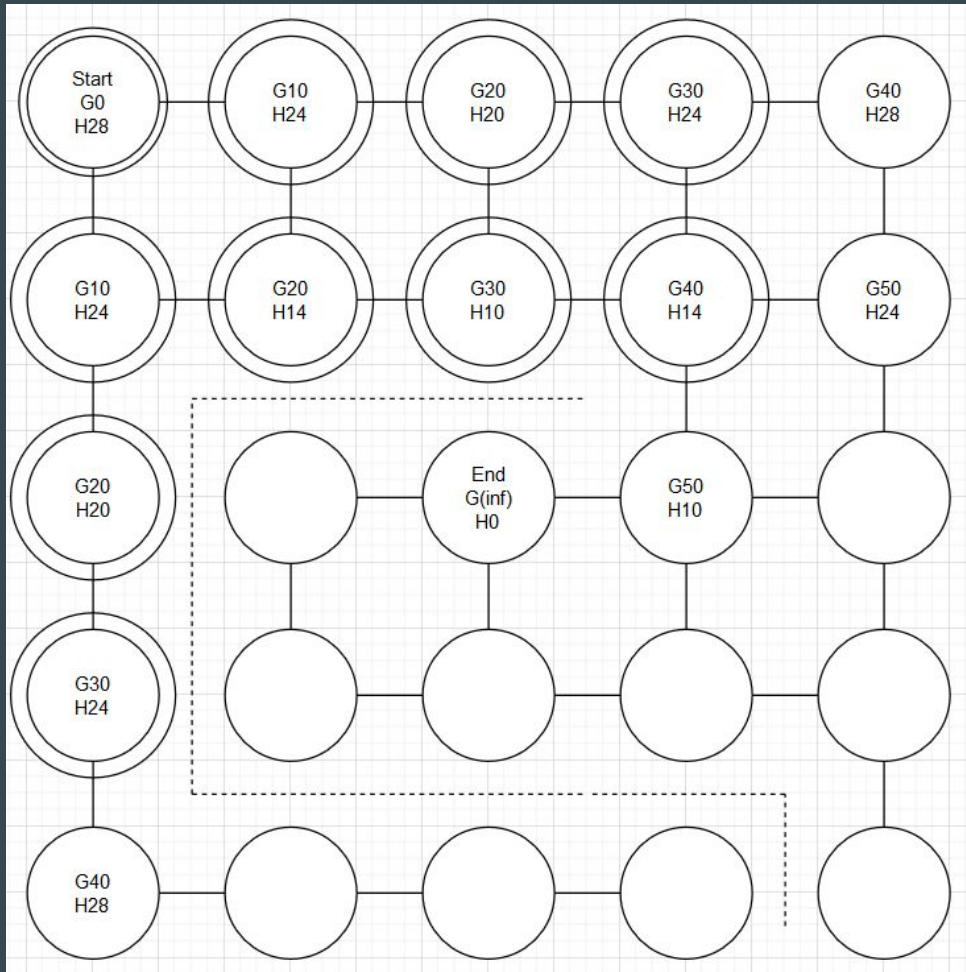
A* (cont.)




Start
G0
H28
G10
H24
G20
H20
G30
H24
G40
H28
G10
H24
G20
H14
G30
H10
G40
H14
G50
H24
G20
H20
End
G(inf)
H0
G50
H10
G30
H24

A* (cont.)




Start
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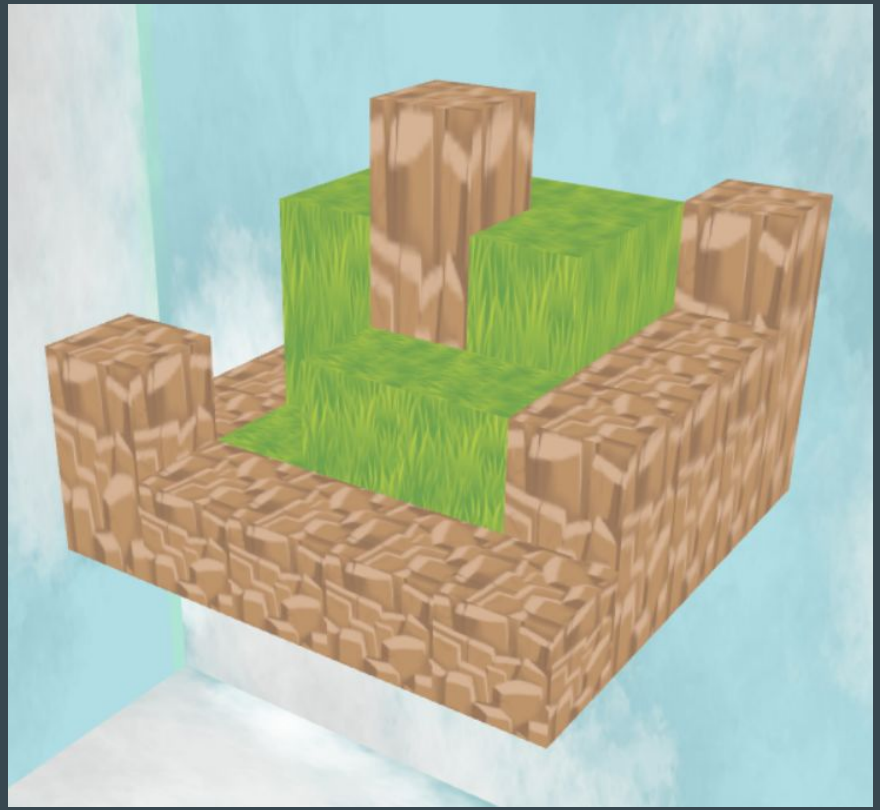
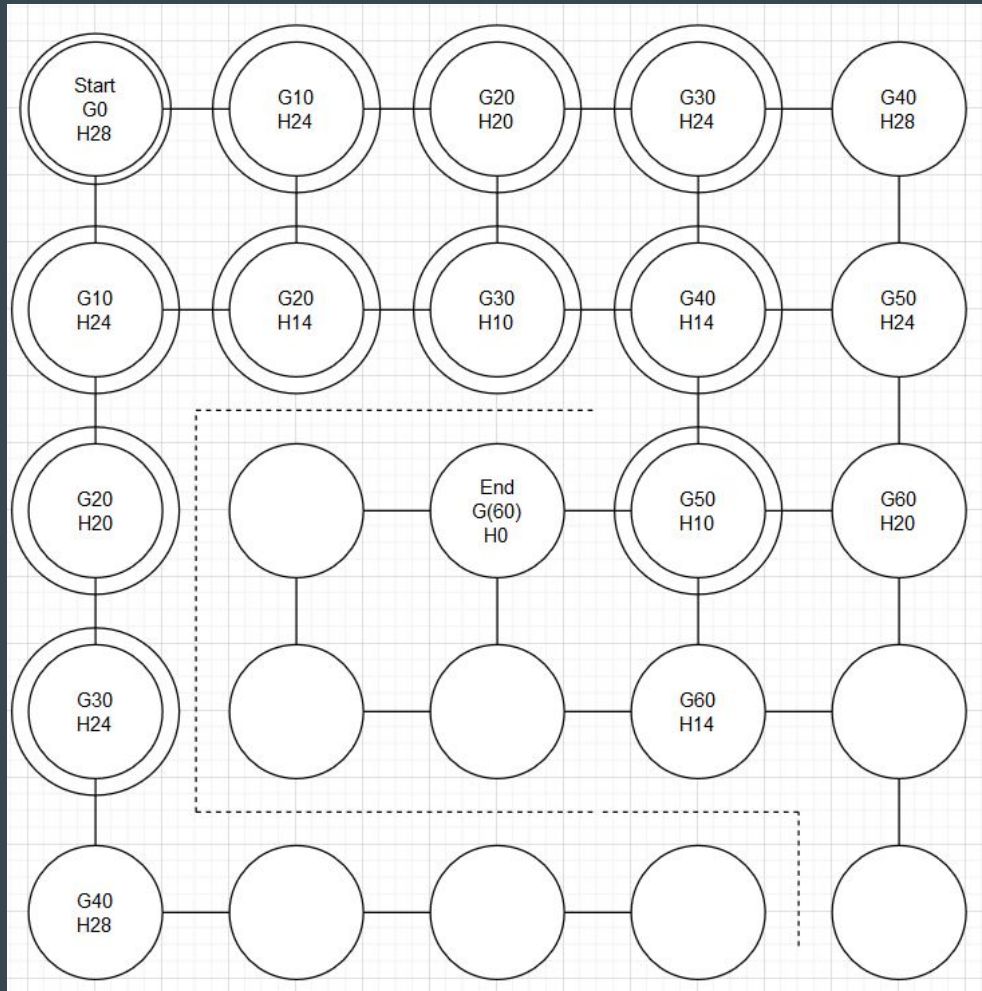
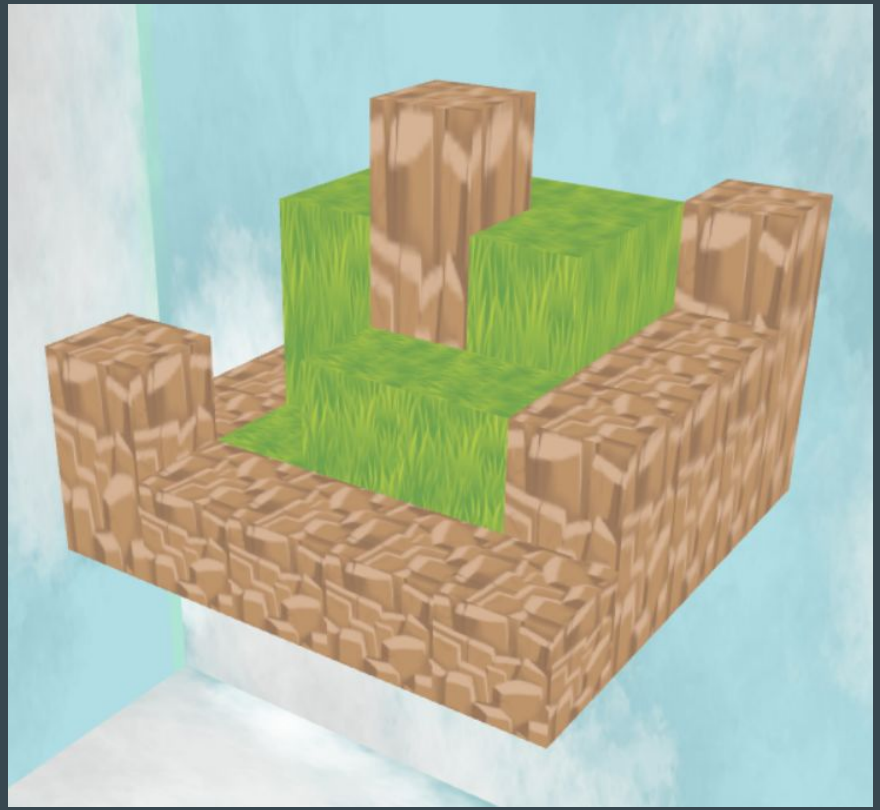
G10
H24
G20
H20
G30
H24
G40
H28
G10
H24
G20
H14
G30
H10
G40
H14
G50
H24
G20
H20
End
G(inf)
H0
G50
H10
G30
H24
G40
H28

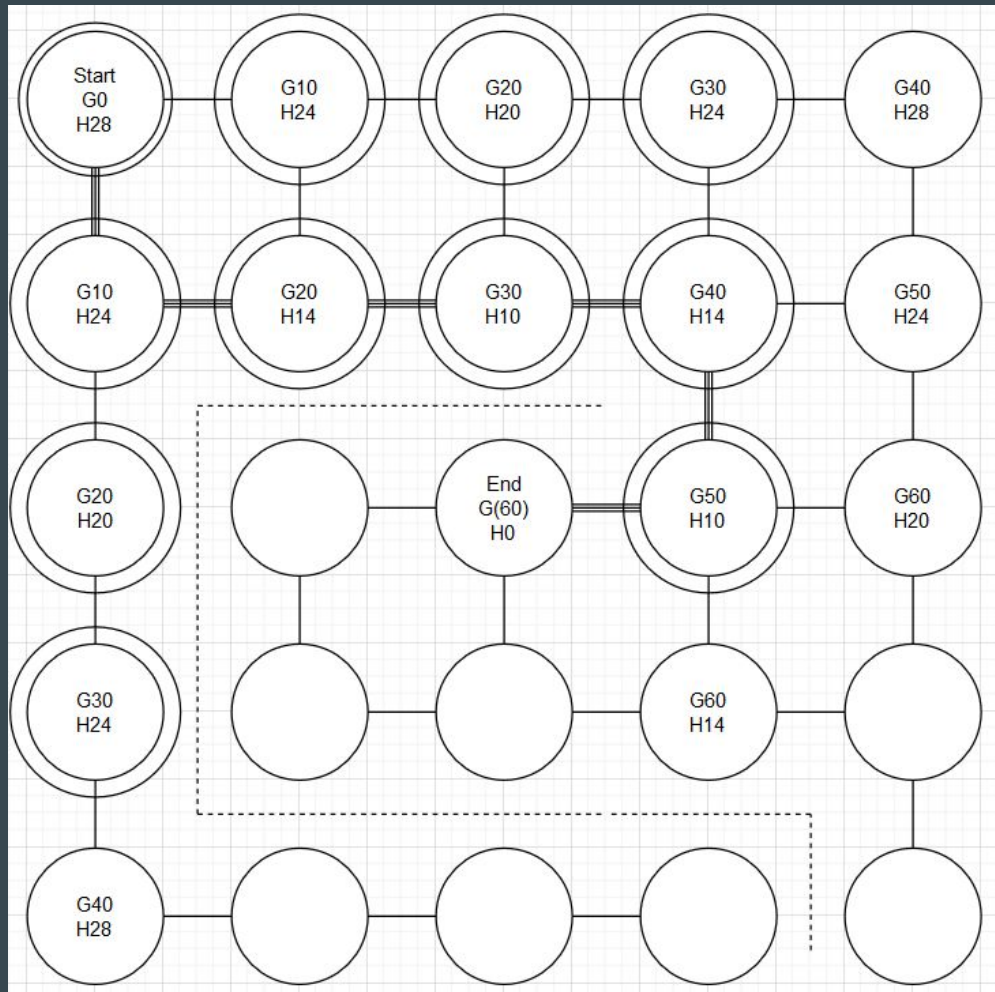
A* (cont.)




Start
G0
H28
G10
H24
G20
H20
G30
H24
G40
H28
G10
H24
G20
H14
G30
H10
G40
H14
G50
H24
G20
H20
End
G(60)
H0
G50
H10
G60
H20
G30
H24
G60
H14
G40
H28

A* (cont.)




Start
G0
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H20
G30
H24
G40
H28
G10
H24
G20
H14
G30
H10
G40
H14
G50
H24
G20
H20
End
G(60)
H0
G50
H10
G60
H20
G30
H24
G60
H14
G40
H28

Pathfinder.js Library

Pathfinding.js includes several pathfinding algorithms, including A*

Functions on 2-D square Grid

Will need to be modified for 3-D maps

https://qiao.github.io/PathFinding.js/visual/