

Example 1 : Path (1, 1) to (4,4)

Info printed with debug flag on Search Algorithm DFS

Iteration = 1 , frontier = 0 , Depth = 0 , dist2goal= 4.24264

-Popped 0 (1, 1)

+Pushed 1 (1, 2)

+Pushed 20 (2, 1)

+Pushed 21 (2, 2)

Iteration = 2 , frontier = 2 , Depth = 1 , dist2goal= 2.82843

-Popped 21 (2, 2)

+Pushed 22 (2, 3)

+Pushed 41 (3, 2)

+Pushed 42 (3, 3)

Iteration = 3 , frontier = 4 , Depth = 2 , dist2goal= 1.41421

-Popped 42 (3, 3)

+Pushed 43 (3, 4)

+Pushed 61 (4, 3)

+Pushed 62 (4, 4)

Iteration = 4 , frontier = 6 , Depth = 3 , dist2goal= 0

-Popped 62 (4, 4)

Search Algorithm DFS

Total Iterations 4

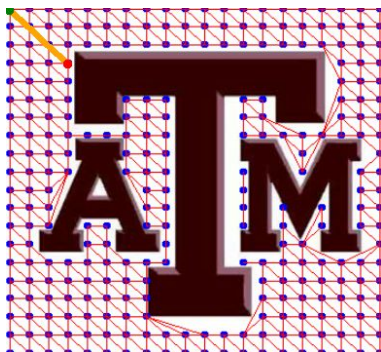
Max Frontier Size 7

Vertices Visited 10/275

Path Length 3

Path Direction:

Vertex 0(1, 1) --> Vertex 21(2, 2) --> Vertex 42(3, 3) --> Vertex 62(4, 4)



Search Algorithm BFS

Iteration = 1 , frontier = 0 , Depth = 0 , dist2goal= 4.24264

-Popped 0 (1, 1)

+Pushed 1 (1, 2)

+Pushed 20 (2, 1)

+Pushed 21 (2, 2)

Iteration = 2 , frontier = 2 , Depth = 1 , dist2goal= 3.60555

-Popped 1 (1, 2)

+Pushed 2 (1, 3)

+Pushed 22 (2, 3)

Iteration = 3 , frontier = 3 , Depth = 1 , dist2goal= 3.60555

-Popped 20 (2, 1)

+Pushed 40 (3, 1)

+Pushed 41 (3, 2)

Iteration = 4 , frontier = 4 , Depth = 1 , dist2goal= 2.82843

-Popped 21 (2, 2)

+Pushed 42 (3, 3)

Iteration = 5 , frontier = 4 , Depth = 2 , dist2goal= 3.16228

-Popped 2 (1, 3)

+Pushed 3 (1, 4)

+Pushed 23 (2, 4)

Iteration = 6 , frontier = 5 , Depth = 2 , dist2goal= 2.23607

-Popped 22 (2, 3)

+Pushed 43 (3, 4)

Iteration = 7 , frontier = 5 , Depth = 2 , dist2goal= 3.16228

-Popped 40 (3, 1)

+Pushed 59 (4, 1)

+Pushed 60 (4, 2)

Iteration = 8 , frontier = 6 , Depth = 2 , dist2goal= 2.23607

-Popped 41 (3, 2)

+Pushed 61 (4, 3)

Iteration = 9 , frontier = 6 , Depth = 2 , dist2goal= 1.41421

-Popped 42 (3, 3)

+Pushed 62 (4, 4)

Iteration = 10 , frontier = 6 , Depth = 3 , dist2goal= 3

-Popped 3 (1, 4)

+Pushed 4 (1, 5)

+Pushed 24 (2, 5)

Iteration = 11 , frontier = 7 , Depth = 3 , dist2goal= 2

-Popped 23 (2, 4)

+Pushed 44 (3, 5)

Iteration = 12 , frontier = 7 , Depth = 3 , dist2goal= 1

-Popped 43 (3, 4)

+Pushed 63 (4, 5)

Iteration = 13 , frontier = 7 , Depth = 3 , dist2goal= 3

-Popped 59 (4, 1)

+Pushed 75 (5, 1)

+Pushed 76 (5, 2)

Iteration = 14 , frontier = 8 , Depth = 3 , dist2goal= 2

-Popped 60 (4, 2)

+Pushed 77 (5, 3)

Iteration = 15 , frontier = 8 , Depth = 3 , dist2goal= 1

-Popped 61 (4, 3)

Iteration = 16 , frontier = 7 , Depth = 3 , dist2goal= 0

-Popped 62 (4, 4)

Search Algorithm BFS

Total Iterations 16

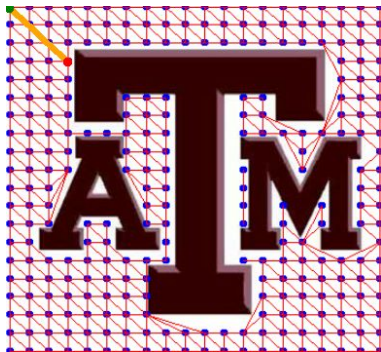
Max Frontier Size 9

Vertices Visited 23/275

Path Length 3

Path Direction:

Vertex 0(1, 1) --> Vertex 21(2, 2) --> Vertex 42 (3, 3) --> Vertex 62(4, 4) -->



Search Algorithm GBFS

Iteration = 1 , frontier = 0 , Depth = 0 , dist2goal= 4.24264

-Popped 0 (1, 1)

+Pushed 1 (1, 2)

+Pushed 20 (2, 1)

+Pushed 21 (2, 2)

Iteration = 2 , frontier = 2 , Depth = 1 , dist2goal= 2.82843

-Popped 21 (2, 2)

+Pushed 22 (2, 3)

+Pushed 41 (3, 2)

+Pushed 42 (3, 3)

Iteration = 3 , frontier = 4 , Depth = 2 , dist2goal= 1.41421

-Popped 42 (3, 3)

+Pushed 43 (3, 4)

+Pushed 61 (4, 3)

+Pushed 62 (4, 4)

Iteration = 4 , frontier = 6 , Depth = 3 , dist2goal= 0

-Popped 62 (4, 4)

Search Algorithm GBFS

Total Iterations 4

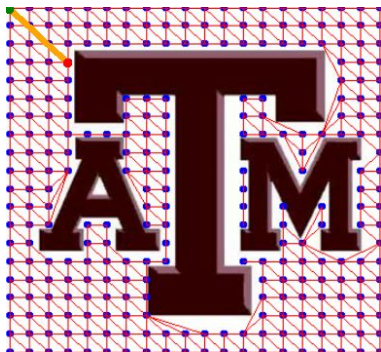
Max Frontier Size 7

Vertices Visited 10/275

Path Length 3

Path Direction:

Vertex 0(1, 1) --> Vertex 21(2, 2) --> Vertex 42(3, 3) --> Vertex 62(4, 4) -->



Example 2 : Path (1, 20) to (20,1)

Search Algorithm DFS

Total Iterations 212

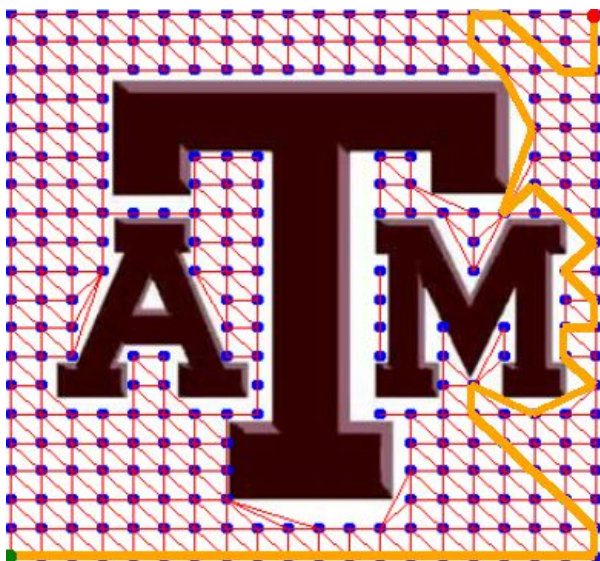
Max Frontier Size 99

Vertices Visited 262/275

Path Length 46

Path Direction:

Vertex 19(1, 20) --> Vertex 39(2, 20) --> Vertex 58(3, 20) --> Vertex 74(4, 20) --> Vertex 86(5, 20) --> Vertex 98(6, 20) --> Vertex 112(7, 20) --> Vertex 129(8, 20) --> Vertex 144(9, 20) --> Vertex 149(10, 20) --> Vertex 154(11, 20) --> Vertex 159(12, 20) --> Vertex 172(13, 20) --> Vertex 184(14, 20) --> Vertex 197(15, 20) --> Vertex 210(16, 20) --> Vertex 222(17, 20) --> Vertex 236(18, 20) --> Vertex 254(19, 20) --> Vertex 274(20, 20) --> Vertex 273(20, 19) --> Vertex 252(19, 18) --> Vertex 233(18, 17) --> Vertex 218(17, 16) --> Vertex 205(16, 15) --> Vertex 204(16, 14) --> Vertex 231(18, 15) --> Vertex 268(20, 14) --> Vertex 248(19, 13) --> Vertex 247(19, 12) --> Vertex 266(20, 12) --> Vertex 265(20, 11) --> Vertex 245(19, 10) --> Vertex 263(20, 9) --> Vertex 244(19, 8) --> Vertex 229(18, 7) --> Vertex 214(17, 8) --> Vertex 227(18, 5) --> Vertex 213(17, 3) --> Vertex 199(16, 2) --> Vertex 198(16, 1) --> Vertex 211(17, 1) --> Vertex 224(18, 2) --> Vertex 239(19, 3) --> Vertex 257(20, 3) --> Vertex 256(20, 2) --> Vertex 255(20, 1)



Search Algorithm BFS

Total Iterations 270

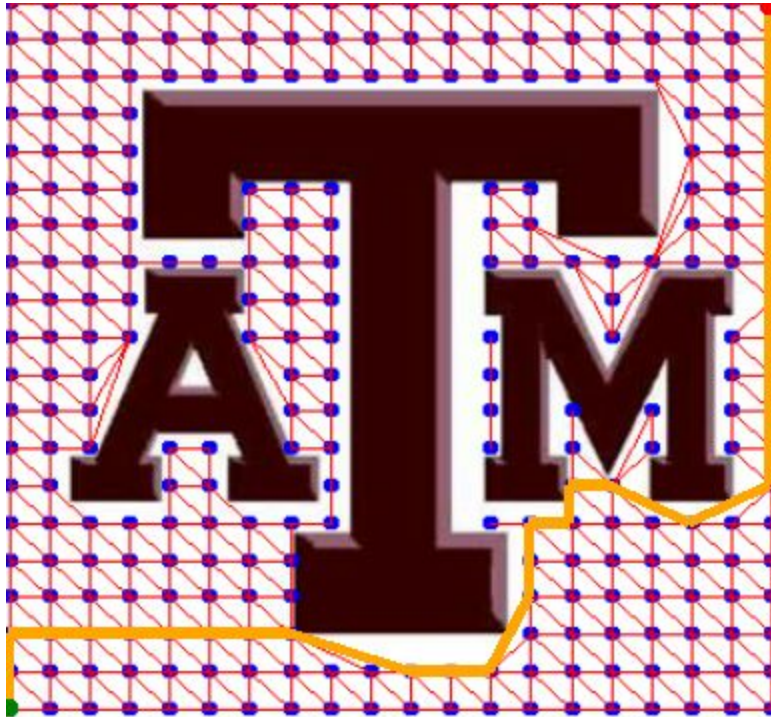
Max Frontier Size 22

Vertices Visited 271/275

Path Length 33

Path Direction:

Vertex 19(1, 20) --> Vertex 18(1, 19) --> Vertex 17(1, 18) --> Vertex 37(2, 18) --> Vertex 56(3, 18) --> Vertex 72(4, 18) --> Vertex 84(5, 18) --> Vertex 96(6, 18) --> Vertex 110(7, 18) --> Vertex 127(8, 18) --> Vertex 153(11, 19) --> Vertex 158(12, 19) --> Vertex 171(13, 19) --> Vertex 181(14, 17) --> Vertex 180(14, 16) --> Vertex 179(14, 15) --> Vertex 192(15, 15) --> Vertex 191(15, 14) --> Vertex 204(16, 14) --> Vertex 231(18, 15) --> Vertex 268(20, 14) --> Vertex 267(20, 13) --> Vertex 266(20, 12) --> Vertex 265(20, 11) --> Vertex 264(20, 10) --> Vertex 263(20, 9) --> Vertex 262(20, 8) --> Vertex 261(20, 7) --> Vertex 260(20, 6) --> Vertex 259(20, 5) --> Vertex 258(20, 4) --> Vertex 257(20, 3) --> Vertex 256(20, 2) --> Vertex 255(20, 1)



Search Algorithm GBFS

Total Iterations 64

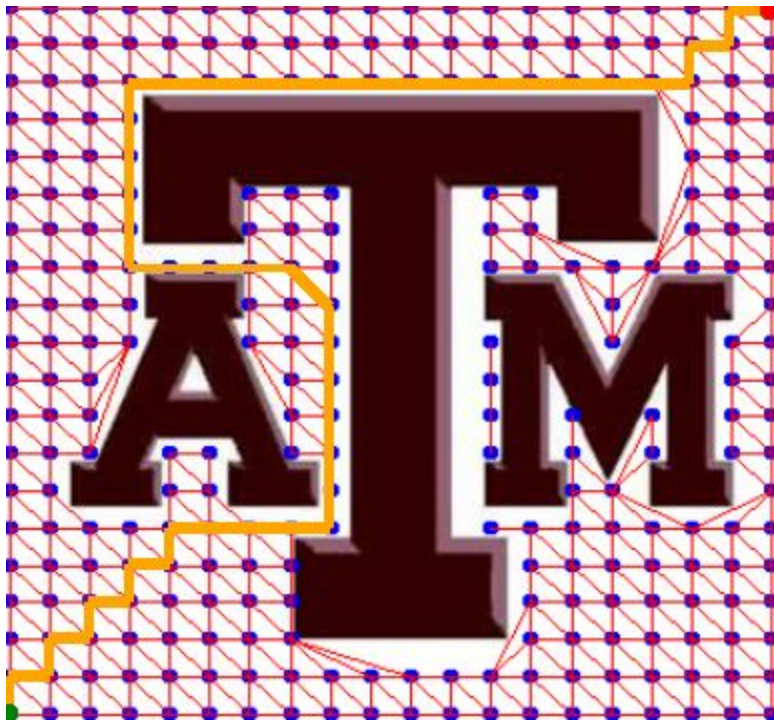
Max Frontier Size 51

Vertices Visited 114/275

Path Length 47

Path Direction:

Vertex 19(1, 20) --> Vertex 18(1, 19) --> Vertex 38(2, 19) --> Vertex 37(2, 18) --> Vertex 56(3, 18) --> Vertex 55(3, 17) --> Vertex 71(4, 17) --> Vertex 70(4, 16) --> Vertex 82(5, 16) --> Vertex 81(5, 15) --> Vertex 93(6, 15) --> Vertex 107(7, 15) --> Vertex 124(8, 15) --> Vertex 142(9, 15) --> Vertex 141(9, 14) --> Vertex 140(9, 13) --> Vertex 139(9, 12) --> Vertex 138(9, 11) --> Vertex 137(9, 10) --> Vertex 136(9, 9) --> Vertex 118(8, 8) --> Vertex 104(7, 8) --> Vertex 90(6, 8) --> Vertex 78(5, 8) --> Vertex 66(4, 8) --> Vertex 65(4, 7) --> Vertex 64(4, 6) --> Vertex 63(4, 5) --> Vertex 62(4, 4) --> Vertex 61(4, 3) --> Vertex 77(5, 3) --> Vertex 89(6, 3) --> Vertex 101(7, 3) --> Vertex 115(8, 3) --> Vertex 132(9, 3) --> Vertex 147(10, 3) --> Vertex 152(11, 3) --> Vertex 157(12, 3) --> Vertex 162(13, 3) --> Vertex 175(14, 3) --> Vertex 187(15, 3) --> Vertex 200(16, 3) --> Vertex 213(17, 3) --> Vertex 225(18, 3) --> Vertex 224(18, 2) --> Vertex 238(19, 2) --> Vertex 237(19, 1) --> Vertex 255(20, 1)



Example 3 : Path (13, 6) to (7,6)

Search Algorithm DFS

Total Iterations 158

Max Frontier Size 91

Vertices Visited 232/275

Path Length 68

Path Direction:

Vertex 163(13, 6) --> Vertex 177(14, 7) --> Vertex 201(16, 8) --> Vertex 214(17, 8) --> Vertex 227(18, 5) --> Vertex 213(17, 3) --> Vertex 199(16, 2) --> Vertex 185(15, 1) --> Vertex 173(14, 1) --> Vertex 160(13, 1) --> Vertex 155(12, 1) --> Vertex 150(11, 1) --> Vertex 145(10, 1) --> Vertex 130(9, 1) --> Vertex 113(8, 1) --> Vertex 99(7, 1) --> Vertex 87(6, 1) --> Vertex 75(5, 1) --> Vertex 59(4, 1) --> Vertex 40(3, 1) --> Vertex 20(2, 1) --> Vertex 0(1, 1) --> Vertex 1(1, 2) --> Vertex 22(2, 3) --> Vertex 43(3, 4) --> Vertex 63(4, 5) --> Vertex 64(4, 6) --> Vertex 45(3, 6) --> Vertex 24(2, 5) --> Vertex 4(1, 5) --> Vertex 5(1, 6) --> Vertex 26(2, 7) --> Vertex 47(3, 8) --> Vertex 67(4, 9) --> Vertex 68(4, 10) --> Vertex 52(3, 13) --> Vertex 31(2, 12) --> Vertex 11(1, 12) --> Vertex 12(1, 13) --> Vertex 33(2, 14) --> Vertex 53(3, 15) --> Vertex 70(4, 16) --> Vertex 83(5, 17) --> Vertex 96(6, 18) --> Vertex 111(7, 19) --> Vertex 129(8, 20) --> Vertex 144(9, 20) --> Vertex 149(10, 20) --> Vertex 154(11, 20) --> Vertex 153(11, 19) --> Vertex 127(8, 18) --> Vertex 109(7, 17) --> Vertex 94(6, 16) --> Vertex 81(5, 15) --> Vertex 80(5, 14) --> Vertex 92(6, 14) --> Vertex 107(7, 15) --> Vertex 124(8, 15) --> Vertex 142(9, 15) --> Vertex 141(9, 14) --> Vertex 140(9, 13) --> Vertex 122(8, 12) --> Vertex 106(7, 10) --> Vertex 120(8, 10) --> Vertex 137(9, 10) --> Vertex 136(9, 9) --> Vertex 118(8, 8) --> Vertex 103(7, 7) --> Vertex 102(7, 6)



Search Algorithm BFS

Total Iterations 247

Max Frontier Size 22

Vertices Visited 263/275

Path Length 28

Path Direction:

Vertex 163(13, 6) --> Vertex 177(14, 7) --> Vertex 201(16, 8) --> Vertex 214(17, 8) --> Vertex 227(18, 5) --> Vertex 213(17, 3) --> Vertex 200(16, 3) --> Vertex 187(15, 3) --> Vertex 175(14, 3) --> Vertex 162(13, 3) --> Vertex 157(12, 3) --> Vertex 152(11, 3) --> Vertex 147(10, 3) --> Vertex 132(9, 3) --> Vertex 115(8, 3) --> Vertex 101(7, 3) --> Vertex 89(6, 3) --> Vertex 77(5, 3) --> Vertex 61(4, 3) --> Vertex 62(4, 4) --> Vertex 63(4, 5) --> Vertex 64(4, 6) --> Vertex 65(4, 7) --> Vertex 66(4, 8) --> Vertex 78(5, 8) --> Vertex 90(6, 8) --> Vertex 104(7, 8) --> Vertex 103(7, 7) --> Vertex 102(7, 6)



Search Algorithm GBFS

Total Iterations 41

Max Frontier Size 35

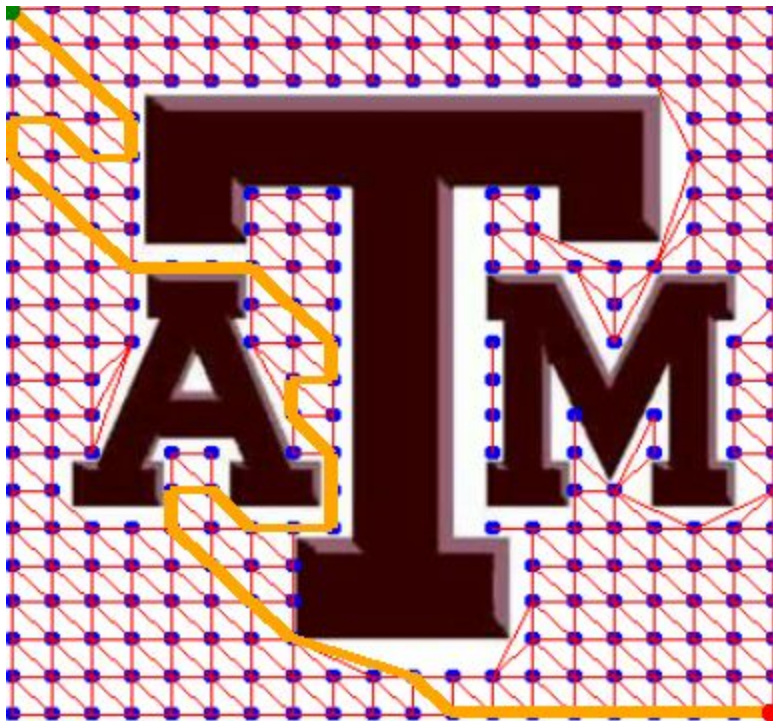
Vertices Visited 75/275

Path Length 28

Path Direction:

Vertex 163(13, 6) --> Vertex 177(14, 7) --> Vertex 201(16, 8) --> Vertex 214(17, 8) --> Vertex 227(18, 5) --> Vertex 213(17, 3) --> Vertex 200(16, 3) --> Vertex 187(15, 3) --> Vertex 175(14, 3) --> Vertex 162(13, 3) --> Vertex 157(12, 3) --> Vertex 152(11, 3) --> Vertex 147(10, 3) --> Vertex 132(9, 3) --> Vertex 115(8, 3) --> Vertex 101(7, 3) --> Vertex 89(6, 3) --> Vertex 77(5, 3) --> Vertex 61(4, 3) --> Vertex 62(4, 4) --> Vertex 63(4, 5) --> Vertex 64(4, 6) --> Vertex 65(4, 7) --> Vertex 66(4, 8) --> Vertex 78(5, 8) --> Vertex 90(6, 8) --> Vertex 104(7, 8) --> Vertex 103(7, 7) --> Vertex 102(7, 6)





Search Algorithm GBFS

Total Iterations 32

Max Frontier Size 36

Vertices Visited 67/275

Path Length 31

Path Direction:

Vertex 0(1, 1) --> Vertex 21(2, 2) --> Vertex 42(3, 3) --> Vertex 62(4, 4) --> Vertex 63(4, 5) --> Vertex 64(4, 6) --> Vertex 65(4, 7) --> Vertex 66(4, 8) --> Vertex 78(5, 8) --> Vertex 90(6, 8) --> Vertex 104(7, 8) --> Vertex 119(8, 9) --> Vertex 137(9, 10) --> Vertex 138(9, 11) --> Vertex 139(9, 12) --> Vertex 140(9, 13) --> Vertex 141(9, 14) --> Vertex 142(9, 15) --> Vertex 124(8, 15) --> Vertex 125(8, 16) --> Vertex 126(8, 17) --> Vertex 127(8, 18) --> Vertex 153(11, 19) --> Vertex 159(12, 20) --> Vertex 172(13, 20) --> Vertex 184(14, 20) --> Vertex 197(15, 20) --> Vertex 210(16, 20) --> Vertex 222(17, 20) --> Vertex 236(18, 20) --> Vertex 254(19, 20) --> Vertex 274(20, 20)



Example 5 : Path (1, 20) to (20, 20)

Search Algorithm DFS

Total Iterations 20

Max Frontier Size 20

Vertices Visited 39/275

Path Length 19

Path Direction:

Vertex 19(1, 20) --> Vertex 39(2, 20) --> Vertex 58(3, 20) --> Vertex 74(4, 20) --> Vertex 86(5, 20) --> Vertex 98(6, 20) --> Vertex 112(7, 20) --> Vertex 129(8, 20) --> Vertex 144(9, 20) --> Vertex 149(10, 20) --> Vertex 154(11, 20) --> Vertex 159(12, 20) --> Vertex 172(13, 20) --> Vertex 184(14, 20) --> Vertex 197(15, 20) --> Vertex 210(16, 20) --> Vertex 222(17, 20) --> Vertex 236(18, 20) --> Vertex 254(19, 20) --> Vertex 274(20, 20)



Search Algorithm BFS

Total Iterations 180

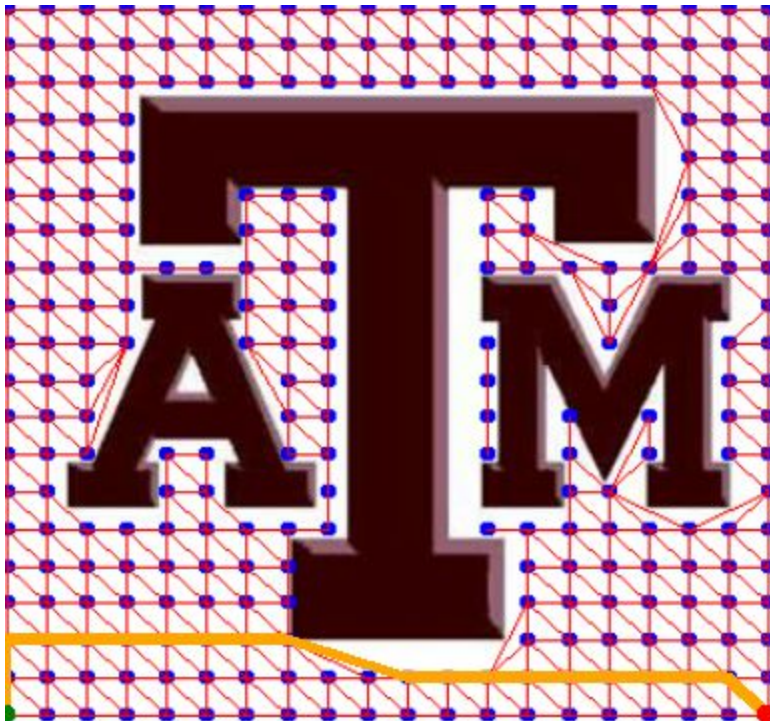
Max Frontier Size 22

Vertices Visited 190/275

Path Length 19

Path Direction:

Vertex 19(1, 20) --> Vertex 18(1, 19) --> Vertex 17(1, 18) --> Vertex 37(2, 18) --> Vertex 56(3, 18) --> Vertex 72(4, 18) --> Vertex 84(5, 18) --> Vertex 96(6, 18) --> Vertex 110(7, 18) --> Vertex 127(8, 18) --> Vertex 153(11, 19) --> Vertex 158(12, 19) --> Vertex 171(13, 19) --> Vertex 183(14, 19) --> Vertex 196(15, 19) --> Vertex 209(16, 19) --> Vertex 221(17, 19) --> Vertex 235(18, 19) --> Vertex 253(19, 19) --> Vertex 274(20, 20)



Search Algorithm GBFS

Total Iterations 20

Max Frontier Size 20

Vertices Visited 39/275

Path Length 19

Path Direction:

Vertex 19(1, 20) --> Vertex 39(2, 20) --> Vertex 58(3, 20) --> Vertex 74(4, 20) --> Vertex 86(5, 20) --> Vertex 98(6, 20) --> Vertex 112(7, 20) --> Vertex 129(8, 20) --> Vertex 144(9, 20) --> Vertex 149(10, 20) --> Vertex 154(11, 20) --> Vertex 159(12, 20) --> Vertex 172(13, 20) --> Vertex 184(14, 20) --> Vertex 197(15, 20) --> Vertex 210(16, 20) --> Vertex 222(17, 20) --> Vertex 236(18, 20) --> Vertex 254(19, 20) --> Vertex 274(20, 20)

