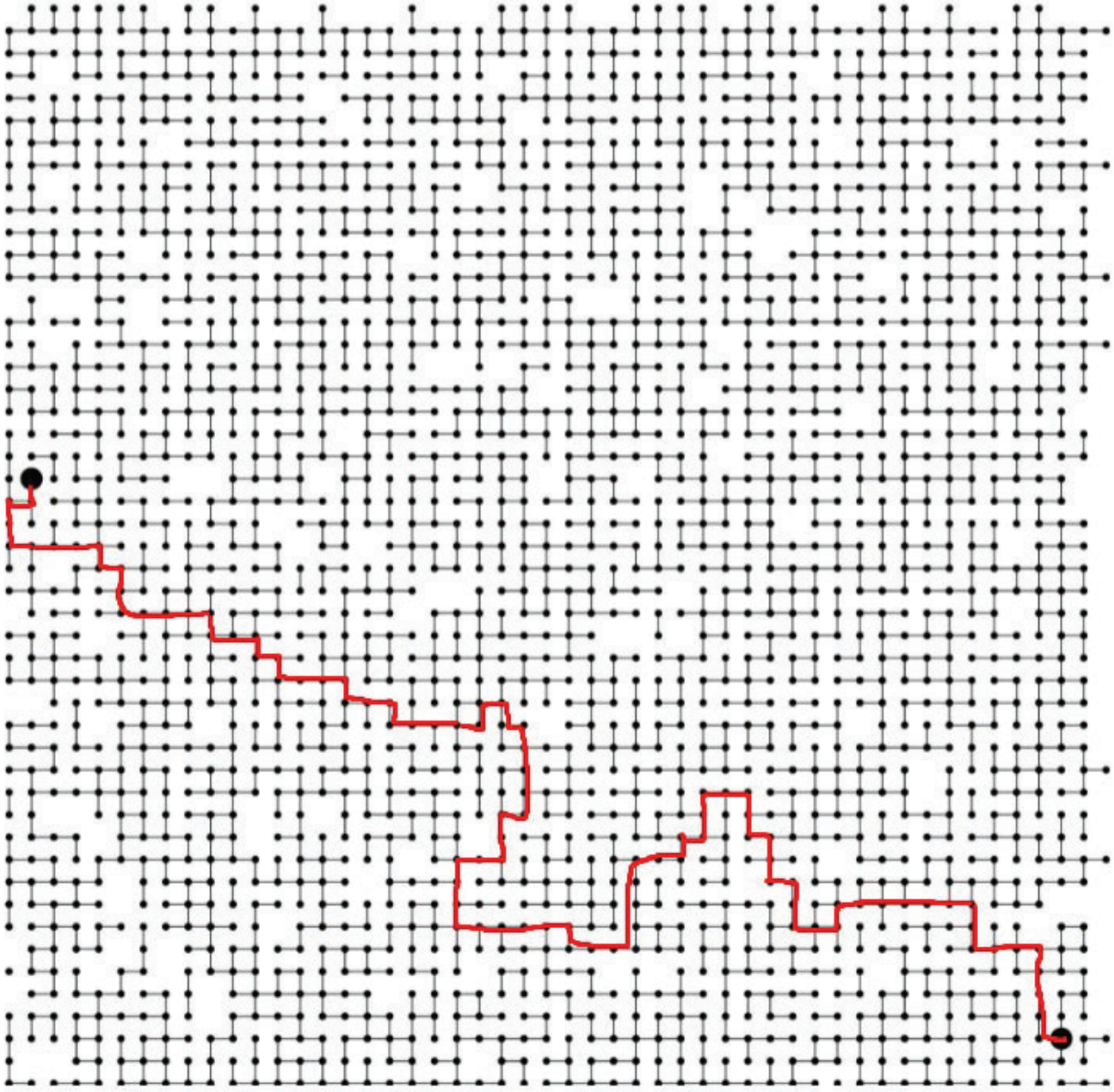
1:



I think that a potential solution would be to find which moves are possible, such as by going down a tree, and go through a few possible unique paths until it finds all of the possible paths. Then it will want to find which one is the shortest by counting the distance for each one that successfully reaches the end, referencing perhaps an array that is saved and has values moved into as more paths are found (using the methods discussed in our lecture to do so efficiently!)

1.1.19:

With the original program:

```
14 377 0.0 seconds
15 610 0.0 seconds
16 987 0.0 seconds
17 1597 0.0 seconds
18 2584 0.0 seconds
19 4181 0.0 seconds
20 6765 0.0 seconds
21 10946 0.0 seconds
22 17711 0.0 seconds
23 28657 0.0 seconds
24 46368 0.0 seconds
25 75025 0.0 seconds
26 121393 0.0 seconds
27 196418 0.0 seconds
28 317811 0.0 seconds
29 514229 0.0 seconds
30 832040 0.0 seconds
31 1346269 0.0 seconds
32 2178309 0.0 seconds
33 3524578 0.0 seconds
34 5702887 0.0 seconds
35 9227465 0.0 seconds
36 14930352 0.0 seconds
37 24157817 0.0 seconds
38 39088169 0.0 seconds
39 63245986 0.0 seconds
40 102334155 0.0 seconds
41 165580141 0.0 seconds
42 267914296 0.0 seconds
43 433494437 1.0 seconds
44 701408733 2.0 seconds
45 1134903170 4.0 seconds
46 1836311903 6.0 seconds
47 2971215073 11.0 seconds
48 4807526976 17.0 seconds
49 7778742049 27.0 seconds
50 12586269025 48.0 seconds
51 20365011074 72.0 seconds
52 32951280099 118.0 seconds
53 53316291173 192.0 seconds
54 86267571272 311.0 seconds
55 139583862445 506.0 seconds
56 225851433717 821.0 seconds
57 365435296162 1315.0 seconds
```

With my improved program that uses dynamic arrays (stops from an integer overflow I believe at 99, because I am not using the BigInteger class):

```
35 9227465 0.0 seconds
36 14930352 0.0 seconds
37 24157817 0.0 seconds
38 39088169 0.0 seconds
39 63245986 0.0 seconds
40 102334155 0.0 seconds
41 165580141 0.0 seconds
42 267914296 0.0 seconds
43 433494437 0.0 seconds
44 701408733 0.0 seconds
45 1134903170 0.0 seconds
46 1836311903 0.0 seconds
47 2971215073 0.0 seconds
48 4807526976 0.0 seconds
49 7778742049 0.0 seconds
50 12586269025 0.0 seconds
51 20365011074 0.0 seconds
52 32951280099 0.0 seconds
53 53316291173 0.0 seconds
54 86267571272 0.0 seconds
55 139583862445 0.0 seconds
56 225851433717 0.0 seconds
57 365435296162 0.0 seconds
58 591286729879 0.0 seconds
59 956722026041 0.0 seconds
60 1548008755920 0.0 seconds
61 2504730781961 0.0 seconds
62 4052739537881 0.0 seconds
63 6557470319842 0.0 seconds
64 10610209857723 0.0 seconds
65 17167680177565 0.0 seconds
66 27777890035288 0.0 seconds
67 44945570212853 0.0 seconds
68 72723460248141 0.0 seconds
69 117669030460994 0.0 seconds
70 190392490709135 0.0 seconds
71 308061521170129 0.0 seconds
72 498454011879264 0.0 seconds
73 806515533049393 0.0 seconds
74 1304969544928657 0.0 seconds
75 2111485077978050 0.0 seconds
76 3416454622906707 0.0 seconds
77 5527939700884757 0.0 seconds
78 8944394323791464 0.0 seconds
79 14472334024676221 0.0 seconds
80 23416728348467685 0.0 seconds
81 37889062373143906 0.0 seconds
82 61305790721611591 0.0 seconds
83 99194853094755497 0.0 seconds
84 160500643816367088 0.0 seconds
85 259695496911122585 0.0 seconds
86 420196140727489673 0.0 seconds
87 679891637638612258 0.0 seconds
88 1100087778366101931 0.0 seconds
89 1779979416004714189 0.0 seconds
90 2880067194370816120 0.0 seconds
91 4660046610375530309 0.0 seconds
92 7540113804746346429 0.0 seconds
93 -6246583658587674878 0.0 seconds
94 1293530146158671551 0.0 seconds
95 -4953053512429003327 0.0 seconds
96 -3659523366270331776 0.0 seconds
97 -8612576878699335103 0.0 seconds
98 6174643828739884737 0.0 seconds
99 -2437933049959450366 0.0 seconds
```

1.1.39:

```
Enter the number of times to run the operation: 10
Size: 10^3
Number of common values: 0
Number of common values: 2
Number of common values: 0
Number of common values: 1
Number of common values: 0
Number of common values: 2
Number of common values: 2
Number of common values: 0
Number of common values: 1
Number of common values: 1
Average number of common values: 0.9

Size: 10^4
Number of common values: 111
Number of common values: 124
Number of common values: 107
Number of common values: 117
Number of common values: 91
Number of common values: 110
Number of common values: 129
Number of common values: 108
Number of common values: 102
Number of common values: 111
Average number of common values: 111.0

Size: 10^5
Number of common values: 10401
Number of common values: 10530
Number of common values: 10483
Number of common values: 10608
Number of common values: 10540
Number of common values: 10520
Number of common values: 10478
Number of common values: 10634
Number of common values: 10532
Number of common values: 10437
Average number of common values: 10516.3

Size: 10^6
Number of common values: 671342
Number of common values: 671384
Number of common values: 670862
Number of common values: 669768
Number of common values: 670159
Number of common values: 670487
Number of common values: 670865
Number of common values: 671498
Number of common values: 670526
Number of common values: 670101
Average number of common values: 670699.2
```