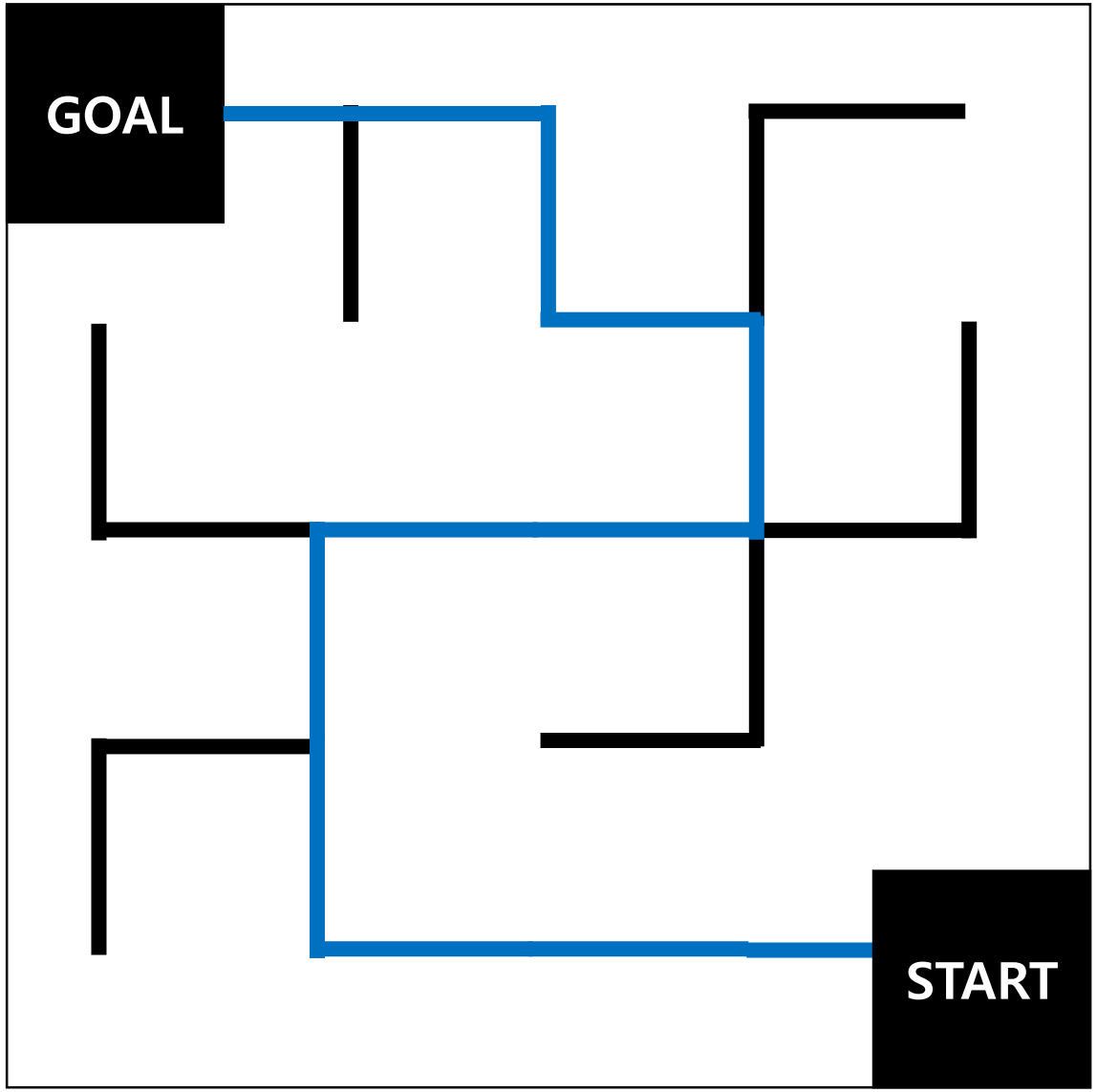
MindStorm EV3

(탐색형 Line trace2)

이건희, 조한진

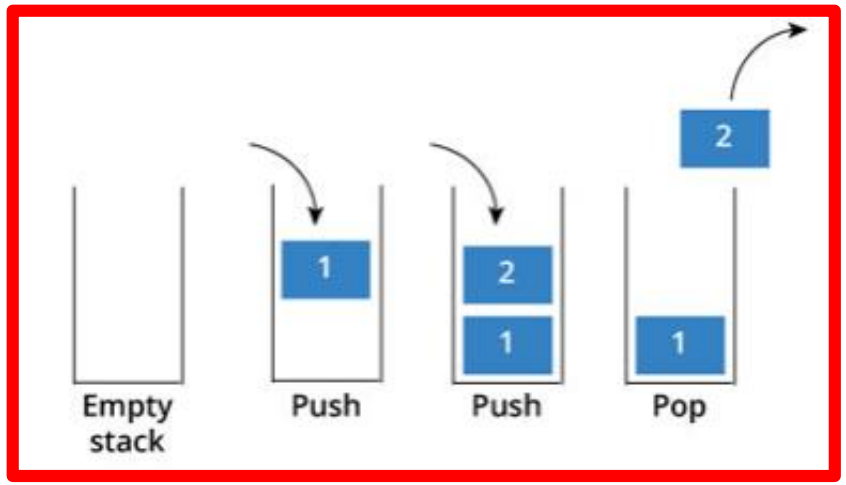
1. 미로 탐색 최단거리로 통과하기

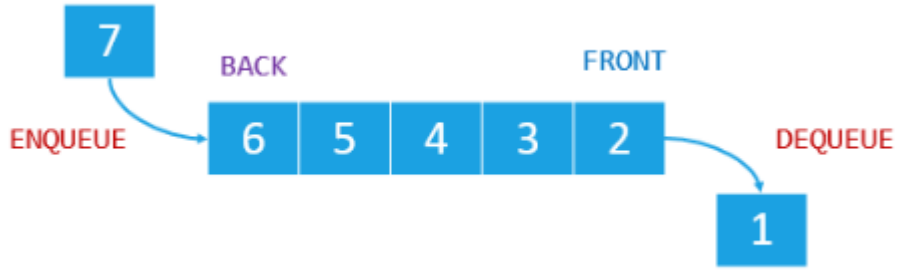


1차 목표: Start → Goal로 갈 때 좌수법으로 완주
2차 목표: Start → Goal로 갈 때 최단경로기억하기
3차 목표: Goal → Start로 깔 때 최단경로로 완주하기

1. 미로 탐색 최단거리로 통과하기
1.1 경로 기억하기 Ideation1

Stack: 후입 선출(Last in First out) 자료구조
Queue: 선입 선출(First in First out) 자료구조





Stack의 연산	의미
push	Stack에 원소를 입력
pop	Stack에 원소를 출력(가장 마지막에 입력된 원소부터)
empty	Stack이 비었으며 참, 아니면 거짓을 반환

1. 미로 탐색 최단거리로 통과하기
1.2 경로 기억하기 Ideation2

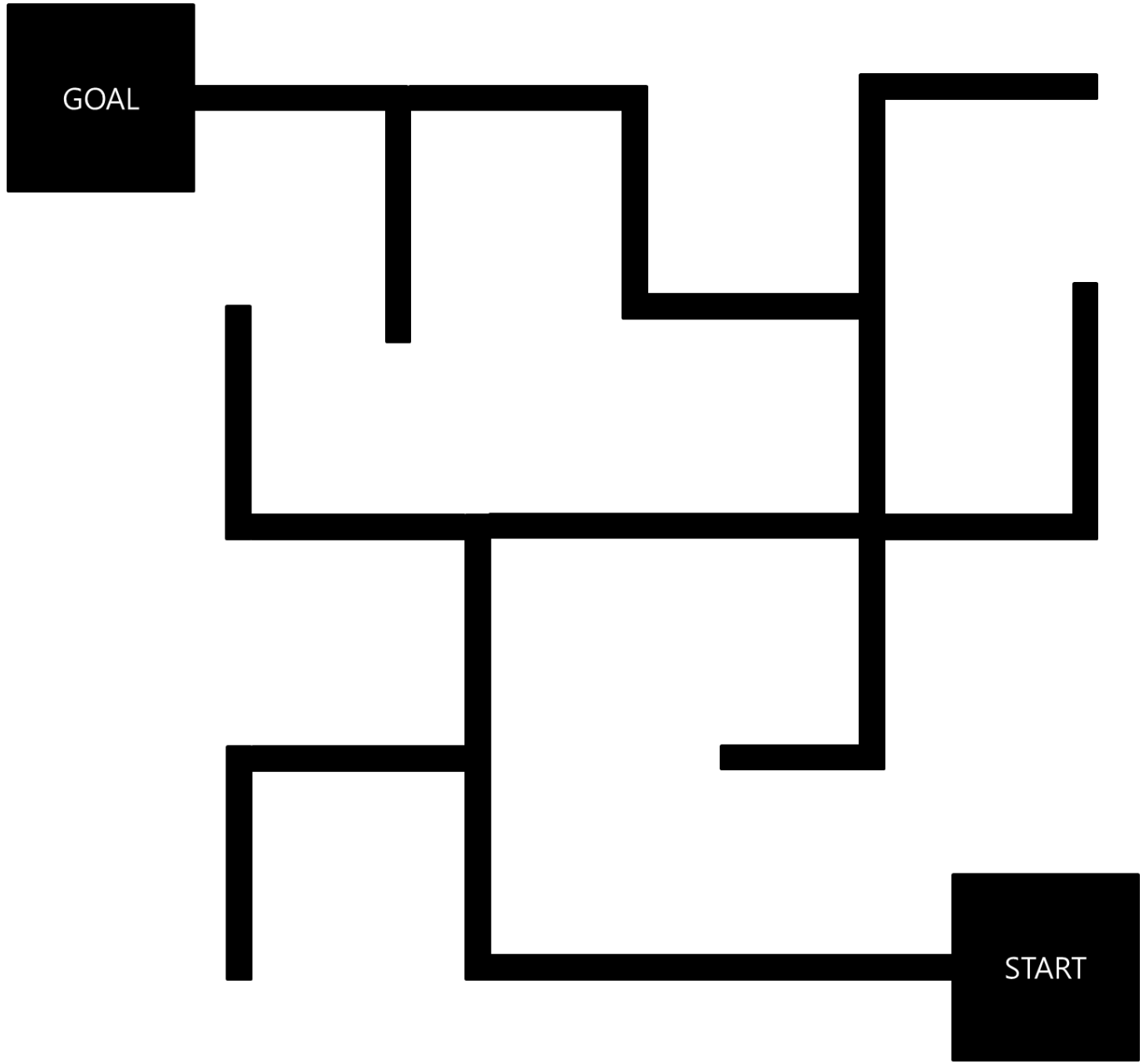
로봇의 이동	표현할 수
좌회전	1
직진	2
우회전	3
U턴	4

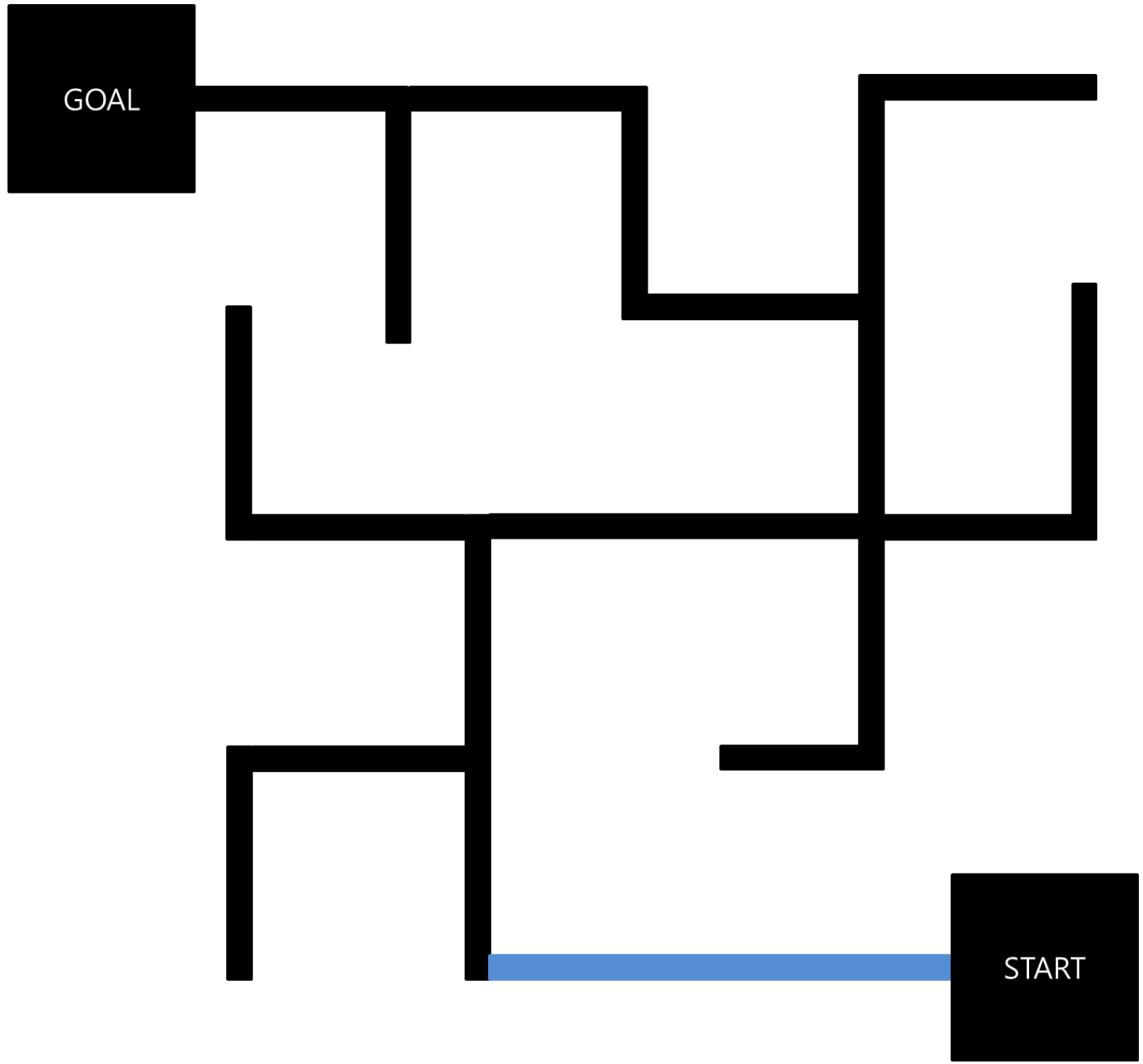
1차 주행: 3(S)→1→1→4→3→1→1→3→4→1→2→1→1→3→1→1→4→1(G)
2차 주행: 1(S)←3←3←4←1←3←3←1←4←3←2←3←3←1←3←3←4←3(G)
대체 가능: | 2 | | 1 | | 2 |

- 1차 주행 시 Stack한 로봇의 이동을 역추적하면 U턴 같은 쓸모 없는 주행도 수행해야한다.
- 필요 없는 주행은 판별하여 삭제 해야함
- 4번 주행의 경우는 삭제하여 0으로 만들고 index를 뒤로 가는 방식 사용

로봇의 이동	인덱스와 데이터 수정
좌회전	Index +=1; STACK[Index] +=1;
직진	Index +=1; STACK[Index] +=2;
우회전	Index +=1; STACK[Index] +=3;
U턴	Index +=1; STACK[Index] +=4;

이 경우는 STACK[index] = 0으로 하고, index -=2


GOAL
START



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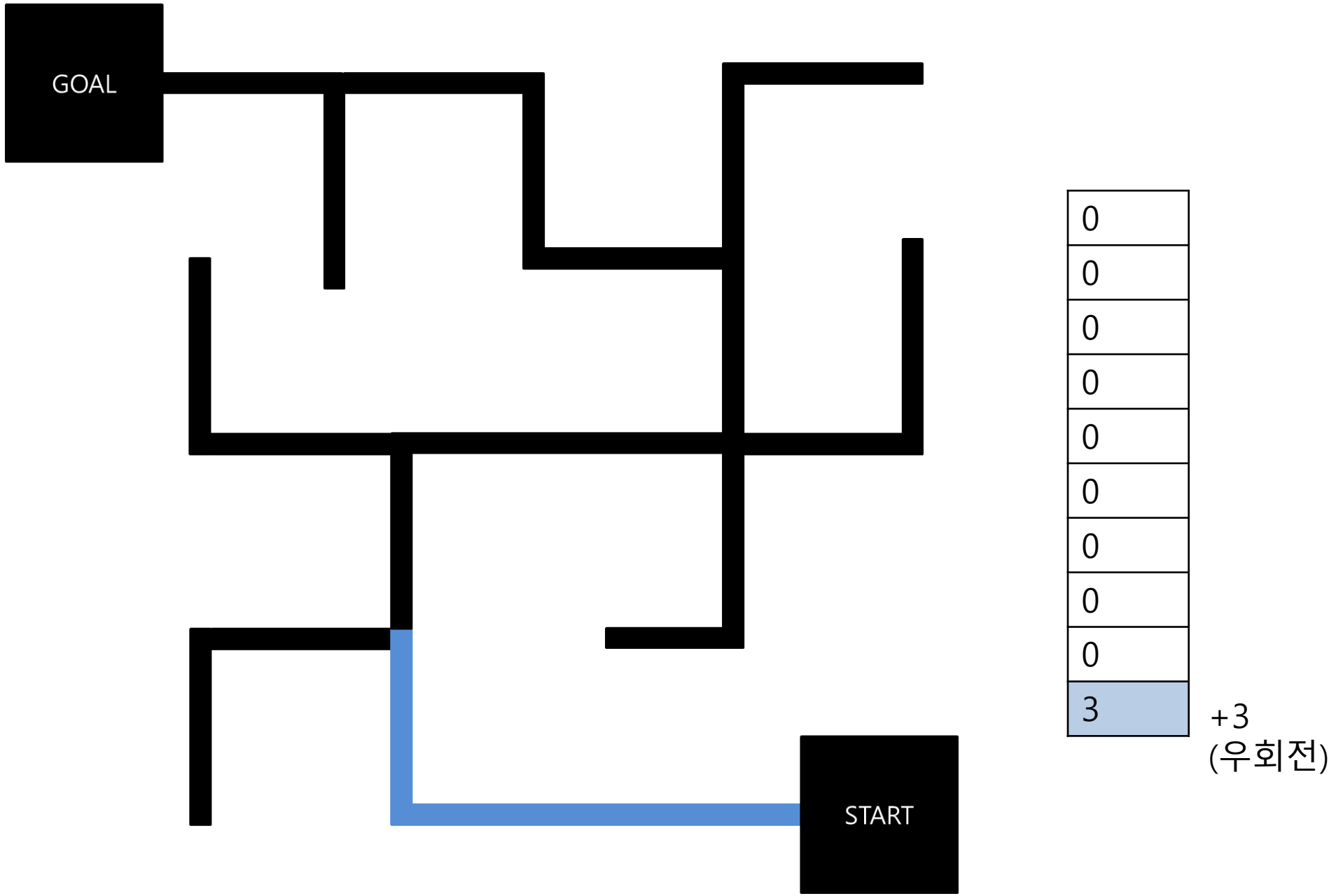
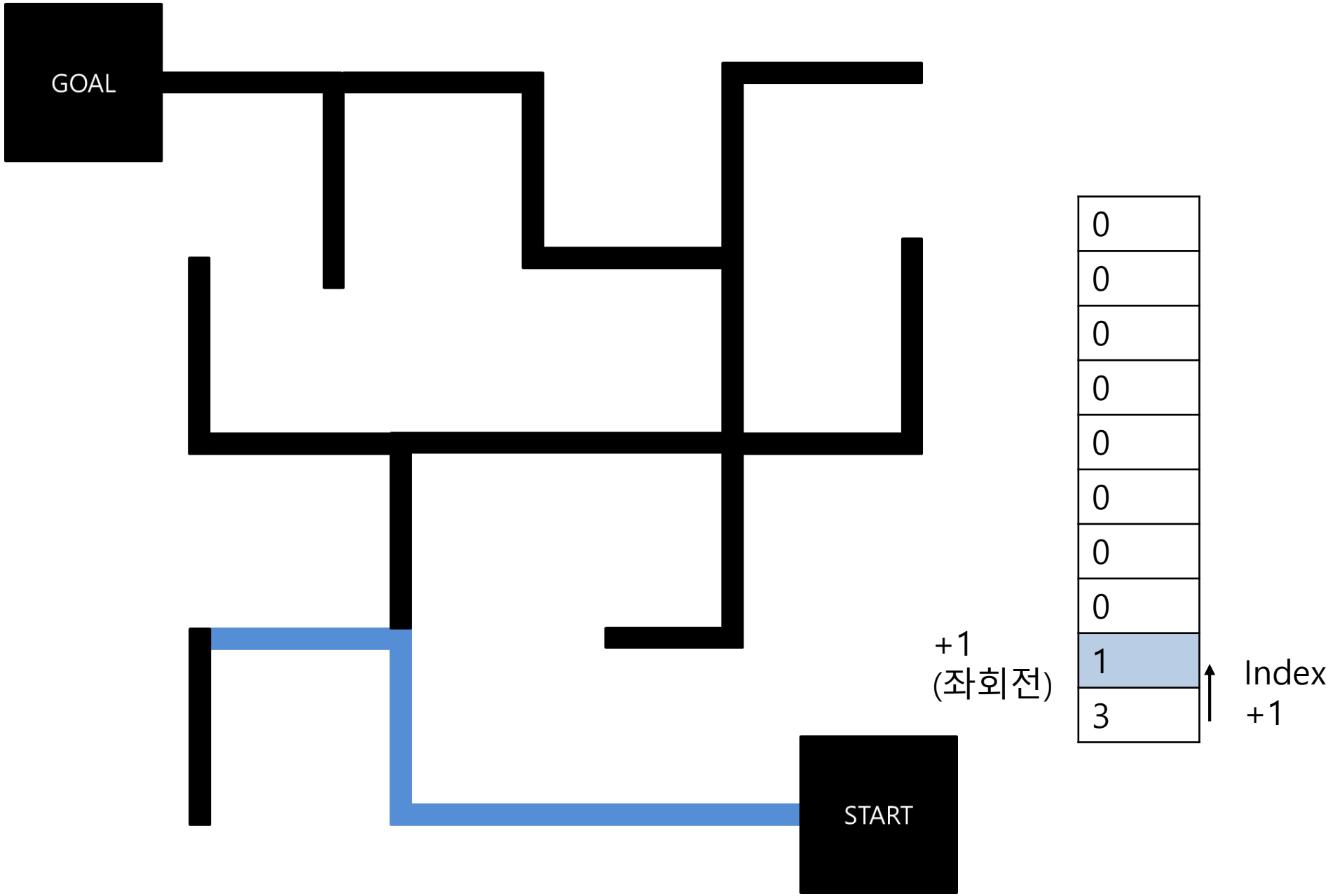
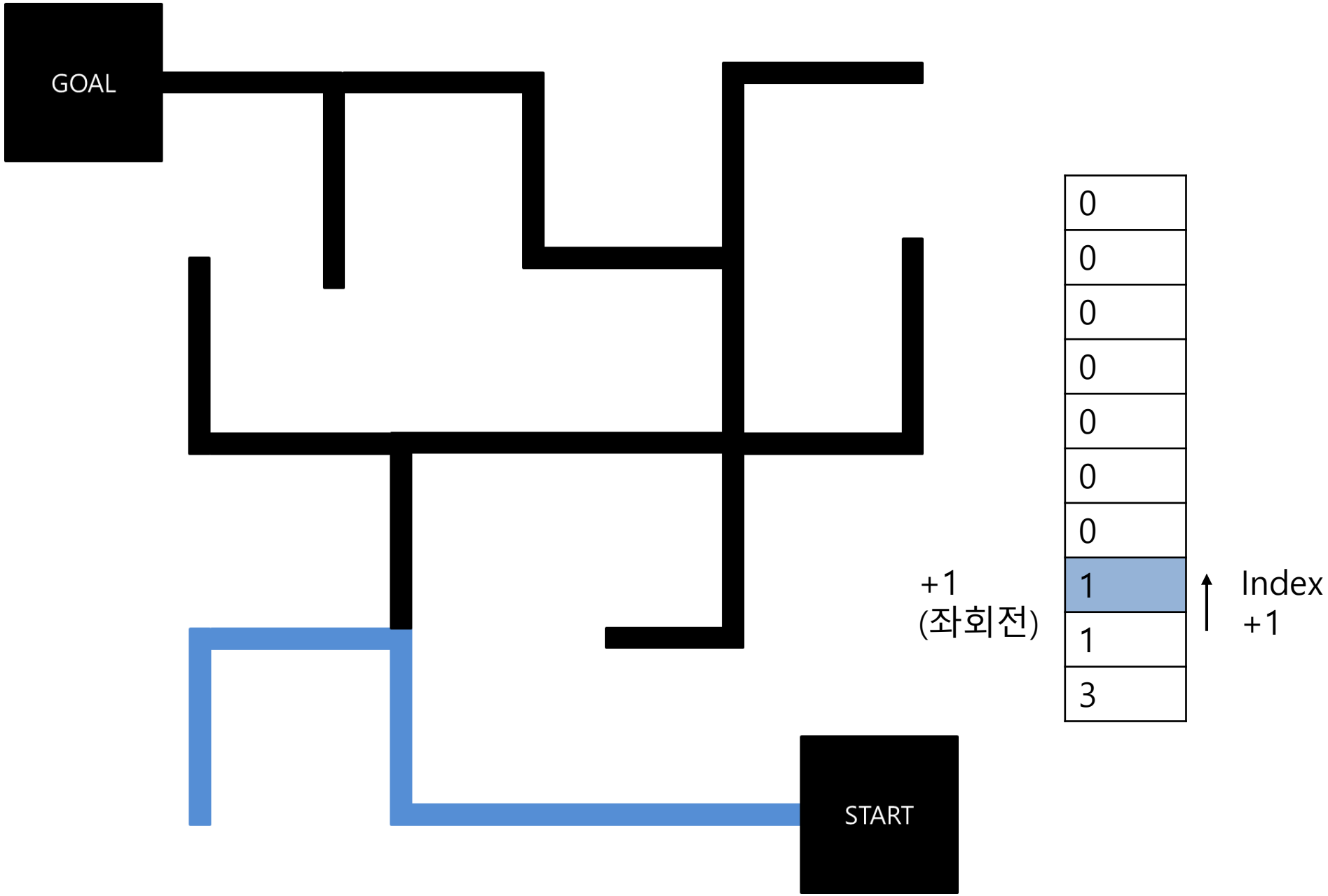


0
0
0
0
0
0
0
0
0
3

+3
(우회전)


GOAL
START
+1
(좌회전)
0
0
0
0
0
0
0
0
1
3
Index
+1


GOAL
START
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0
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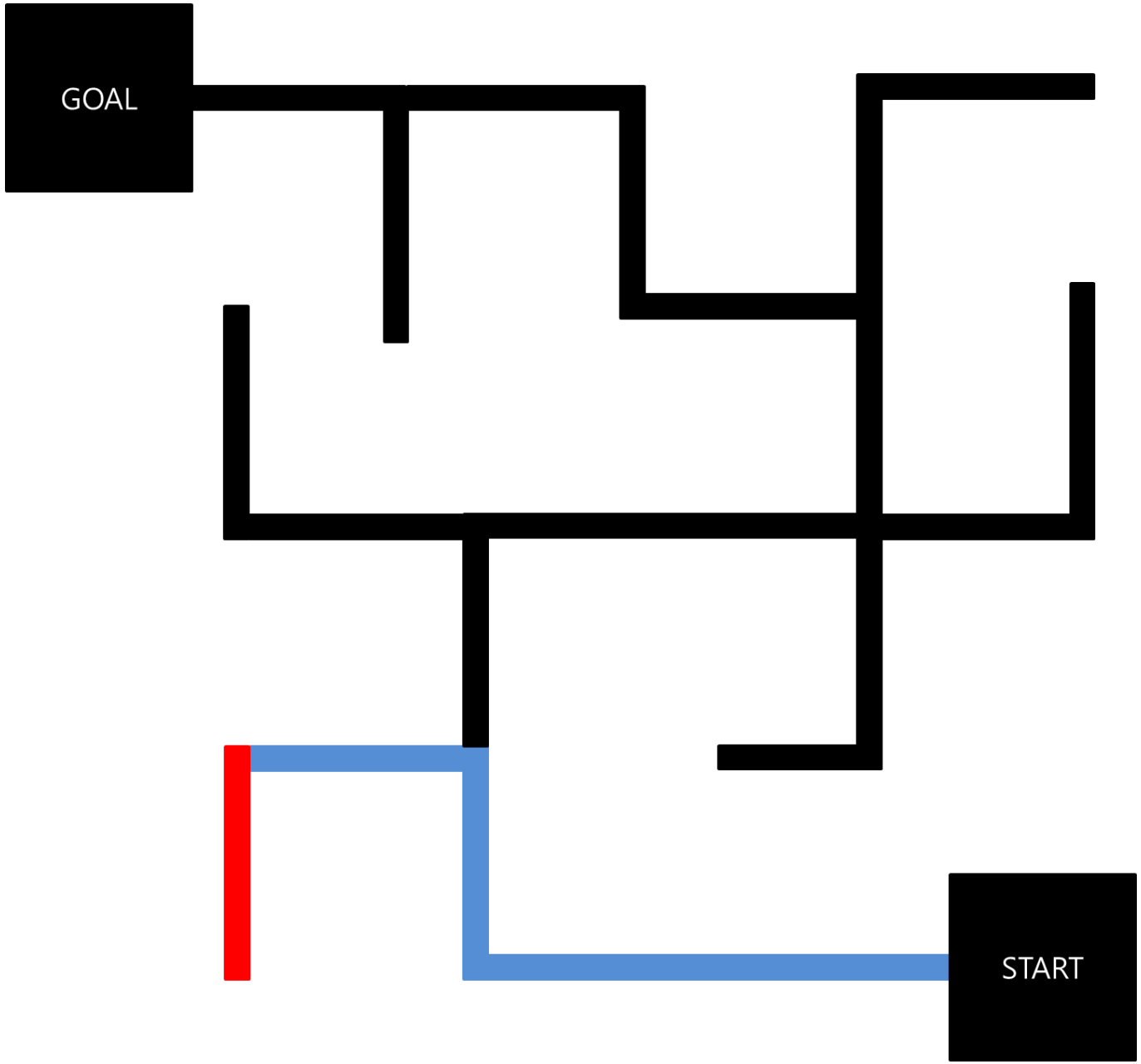
0
0
0
0
1
1
3
+1
(좌회전)
Index
+1

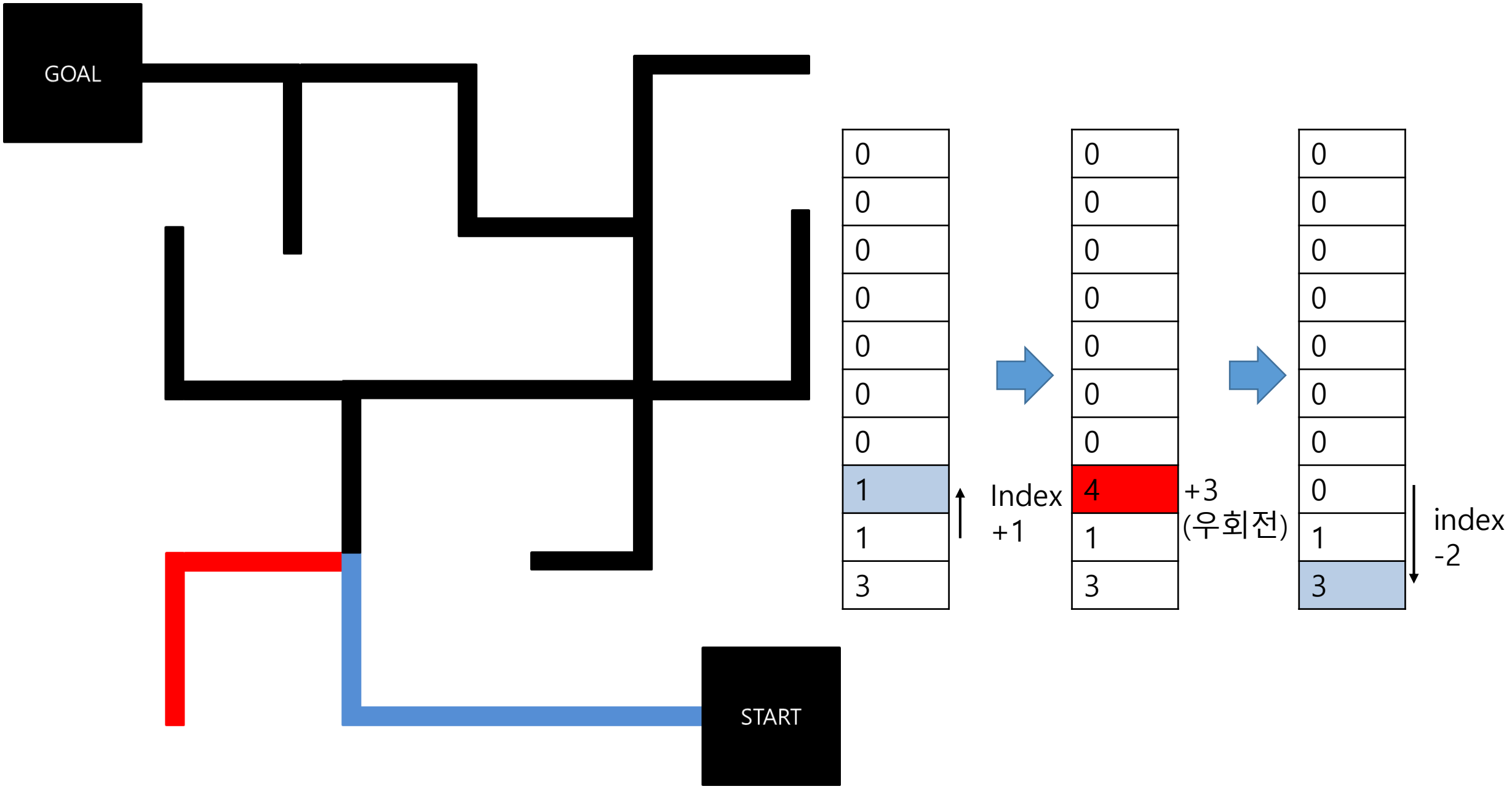


0
0
0
0
0
0
4
1
1
3

+4
(유턴)

0
0
0
0
0
0
0
1
1
3

index
-2


GOAL
START
0
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1
1
3
Index
+1
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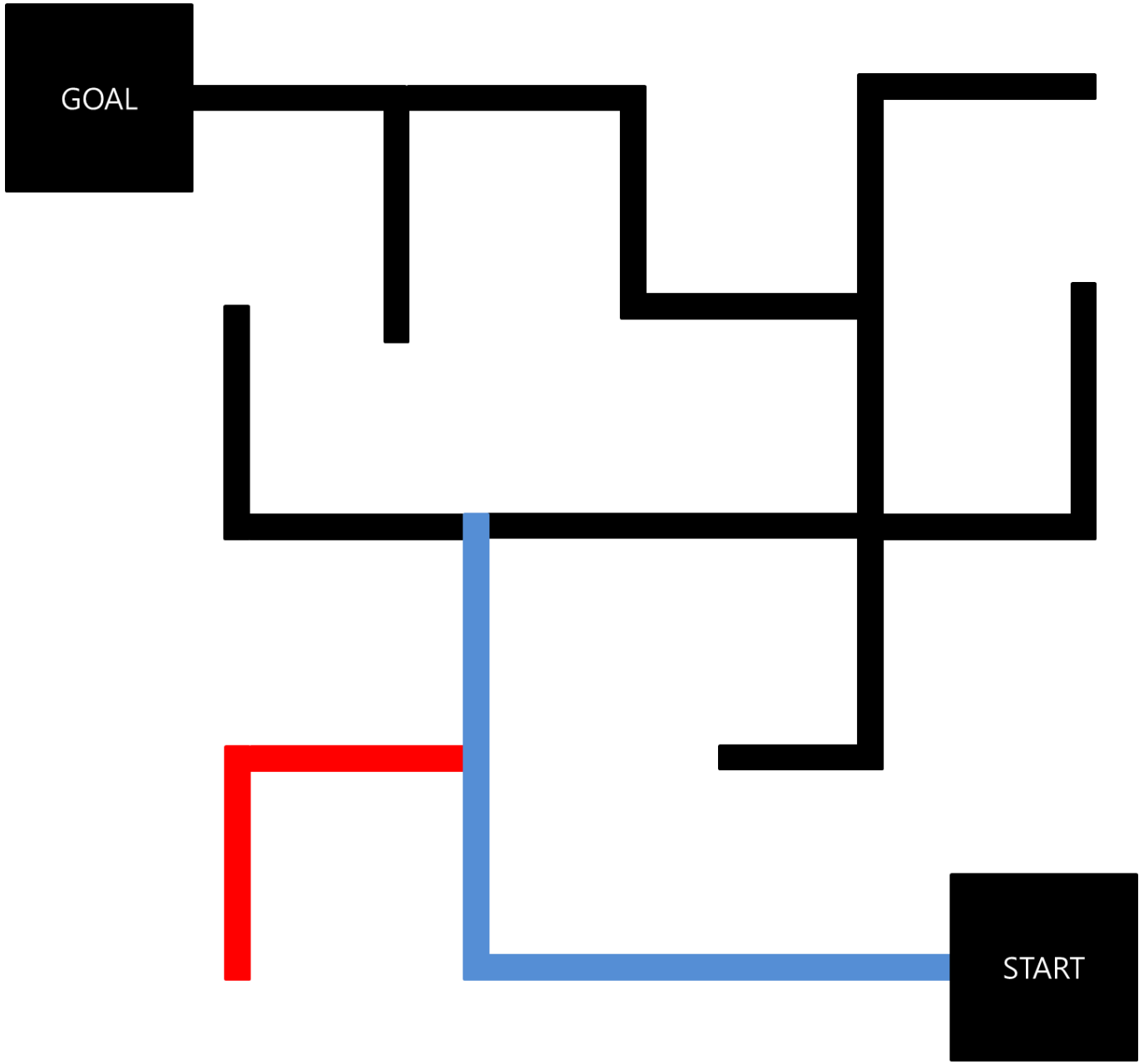
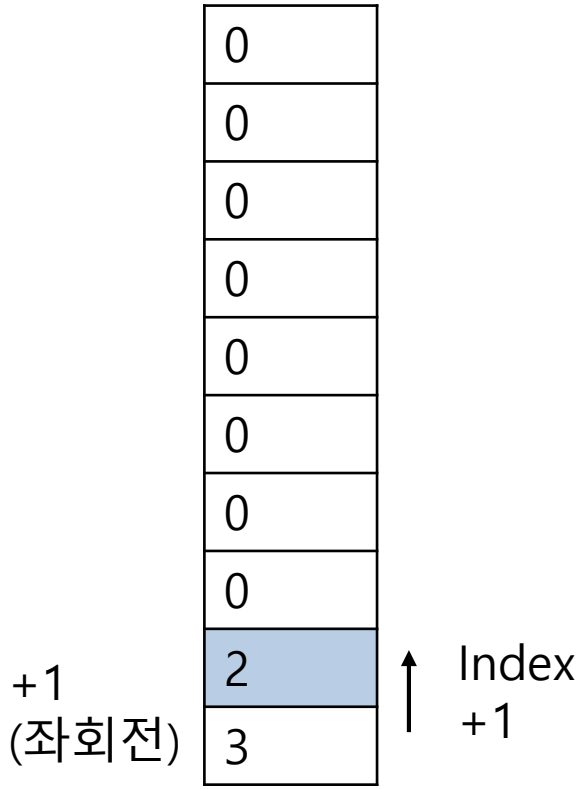
0
0
0
0
0
0
4
1
3
+3
(우회전)
0
0
0
0
0
0
0
0
1
3
index
-2


GOAL
START


0
0
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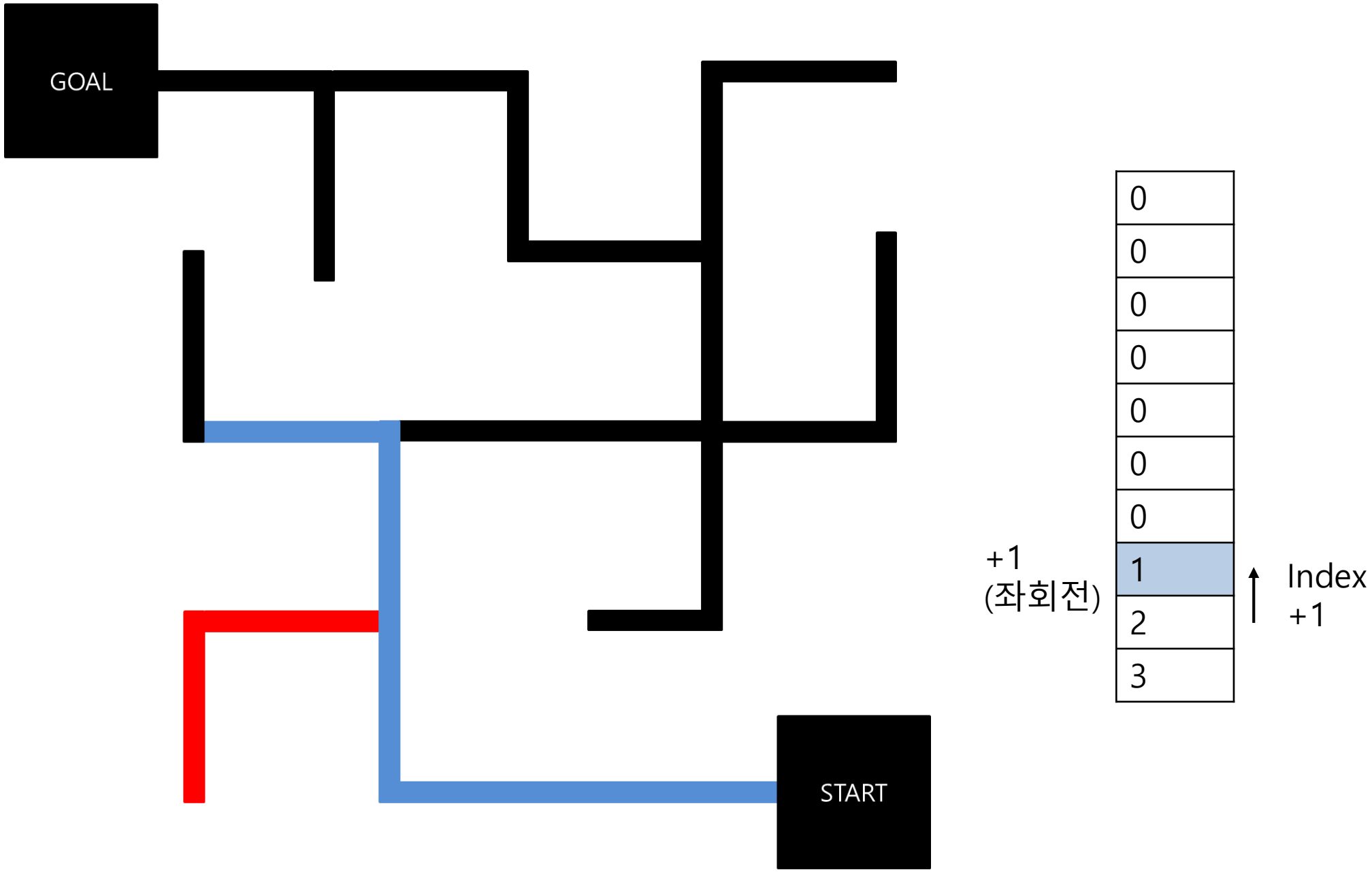
0
0
2
3
+1
(좌회전)
Index
+1


GOAL
START
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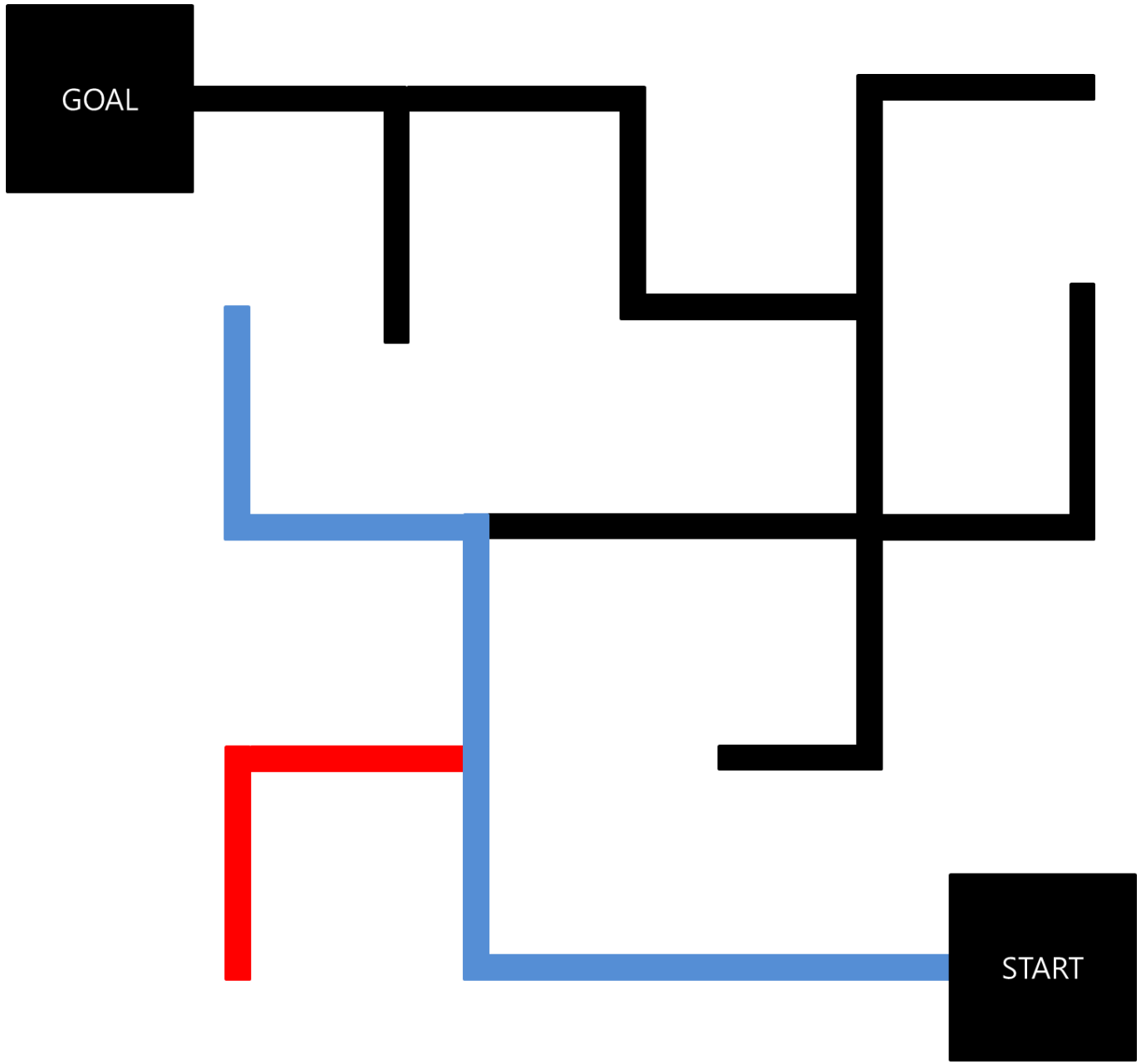
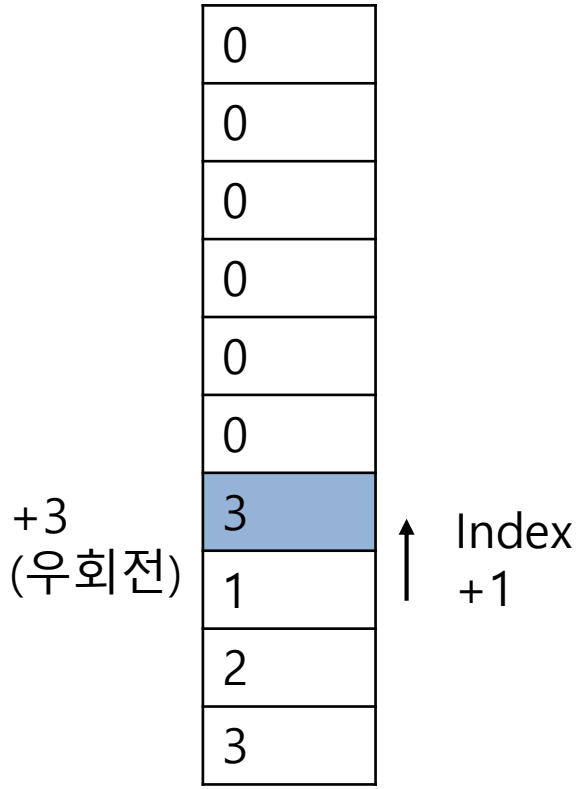
0
1
2
3
+1
(좌회전)
Index
+1


GOAL
START


0
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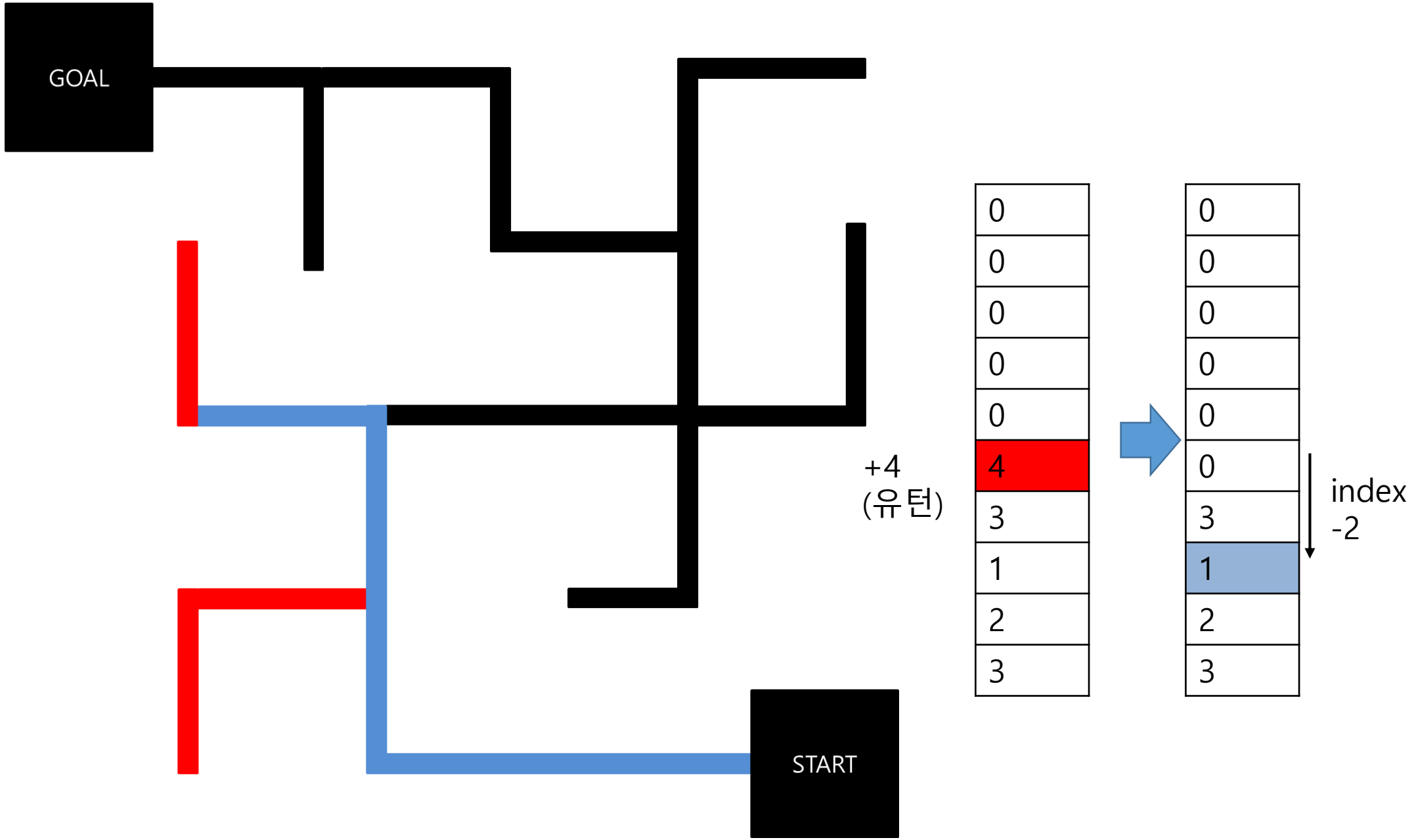
3
1
2
3
+3
(우회전)
Index
+1


GOAL
START
+4
(유턴)
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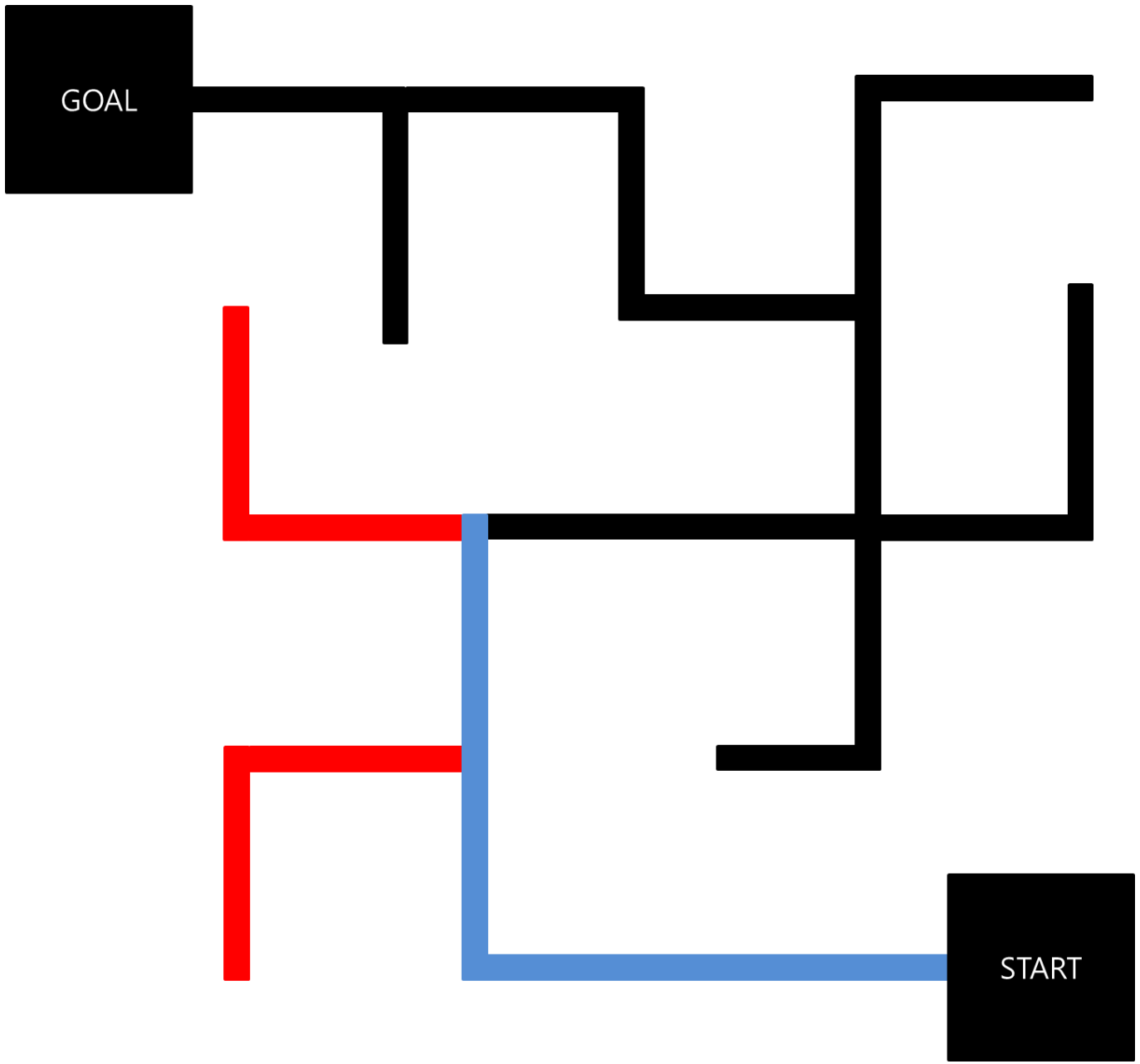
index
-2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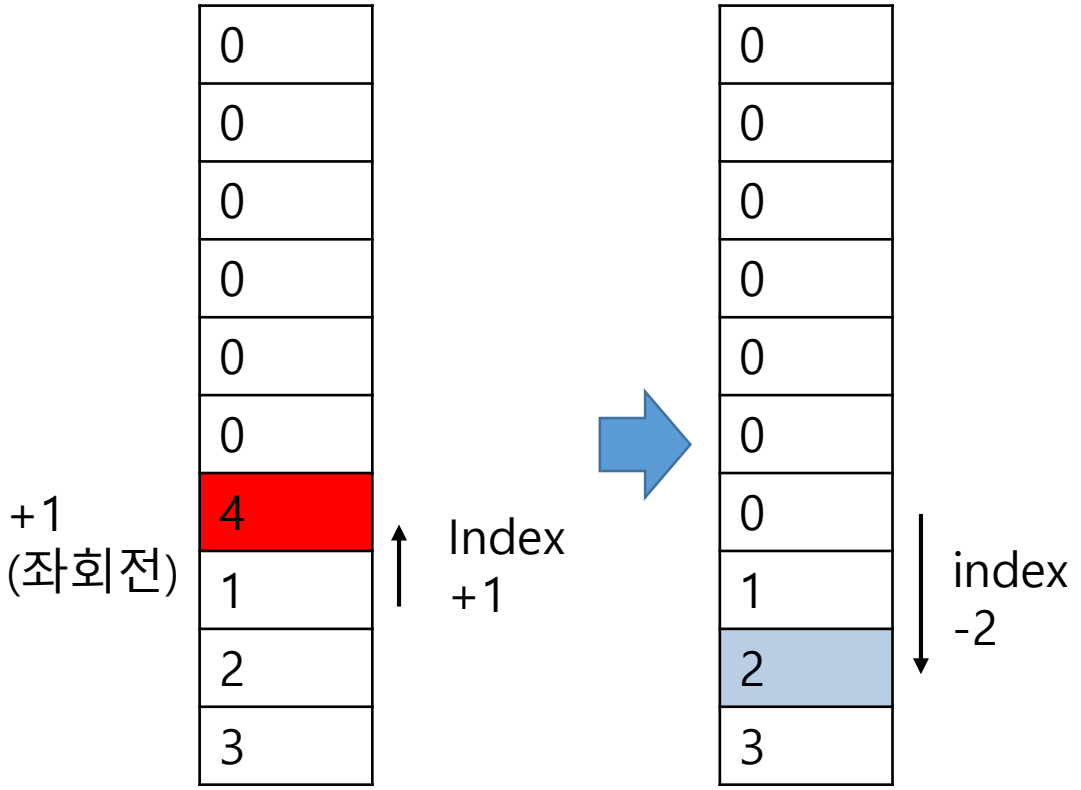
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4
1
2
3
+1
(좌회전)
Index
+1
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1
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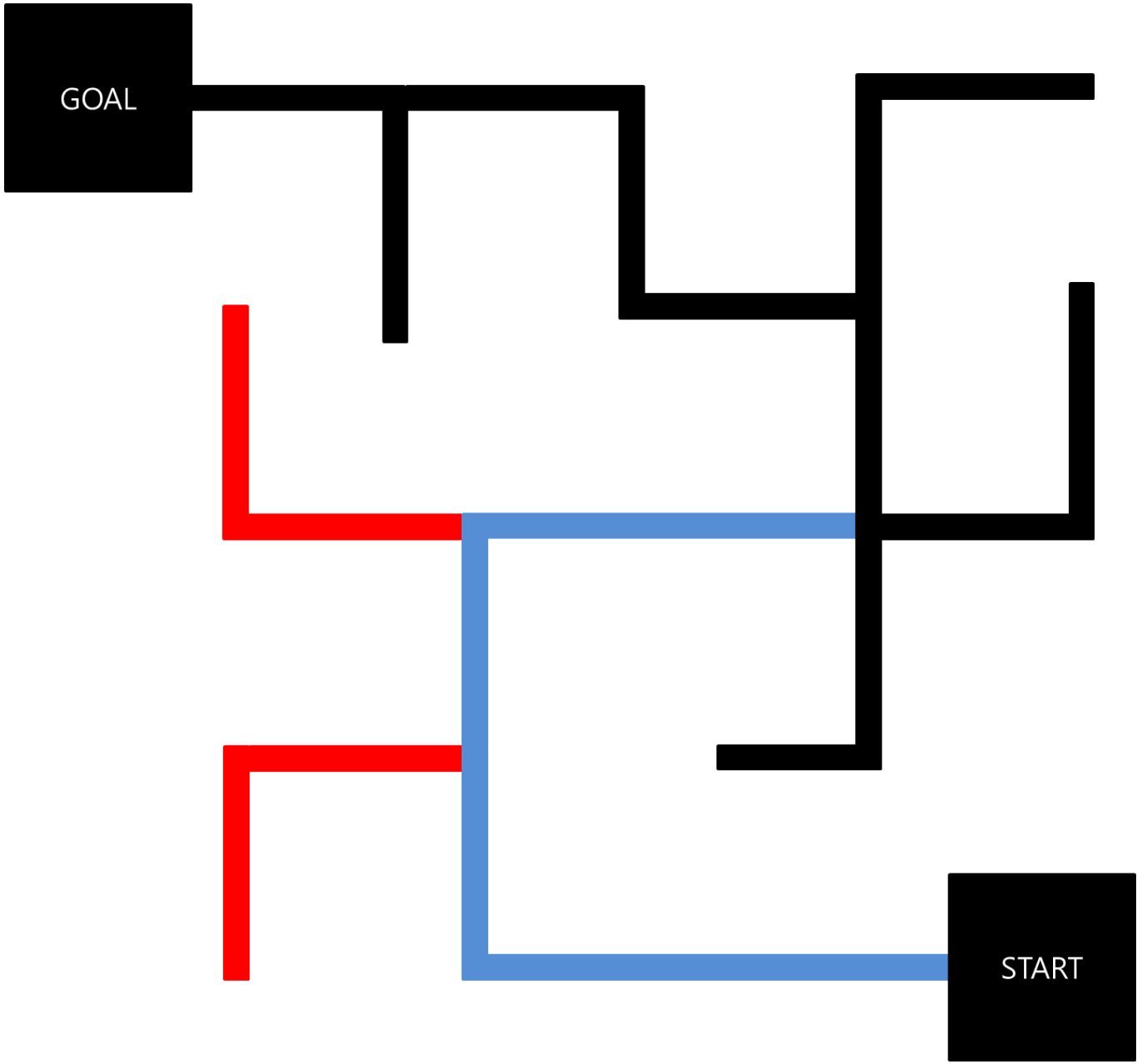
index
-2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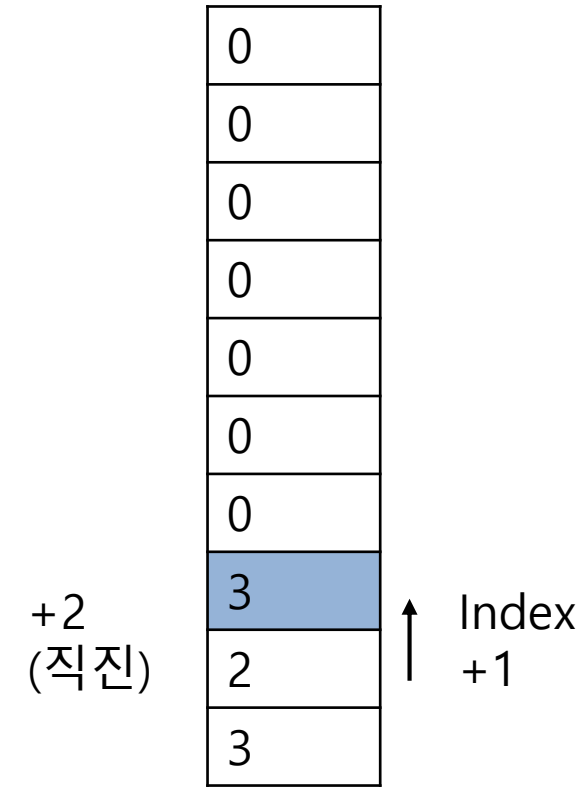
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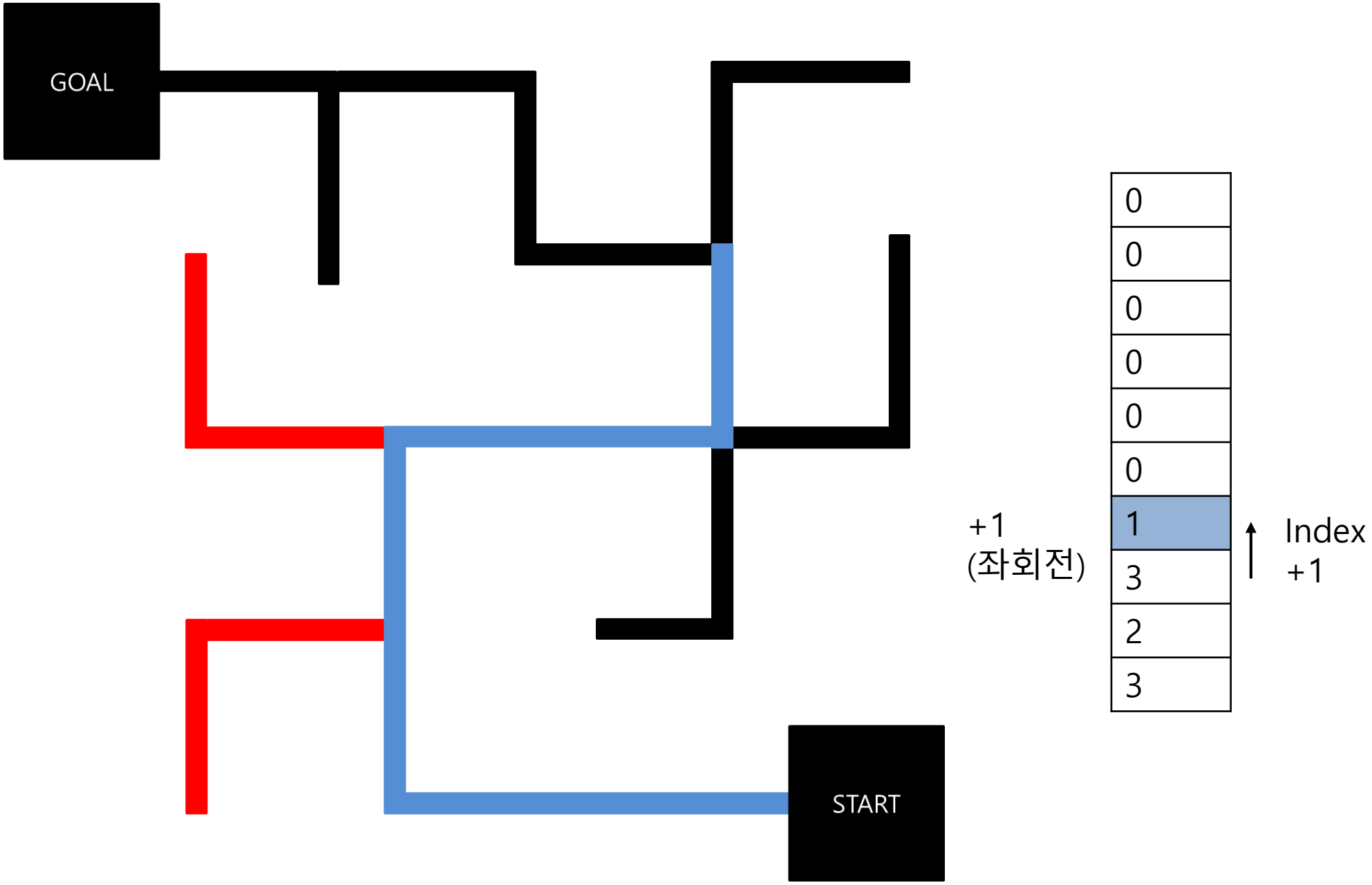
+2
(직진)
Index
+1


GOAL
START
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1
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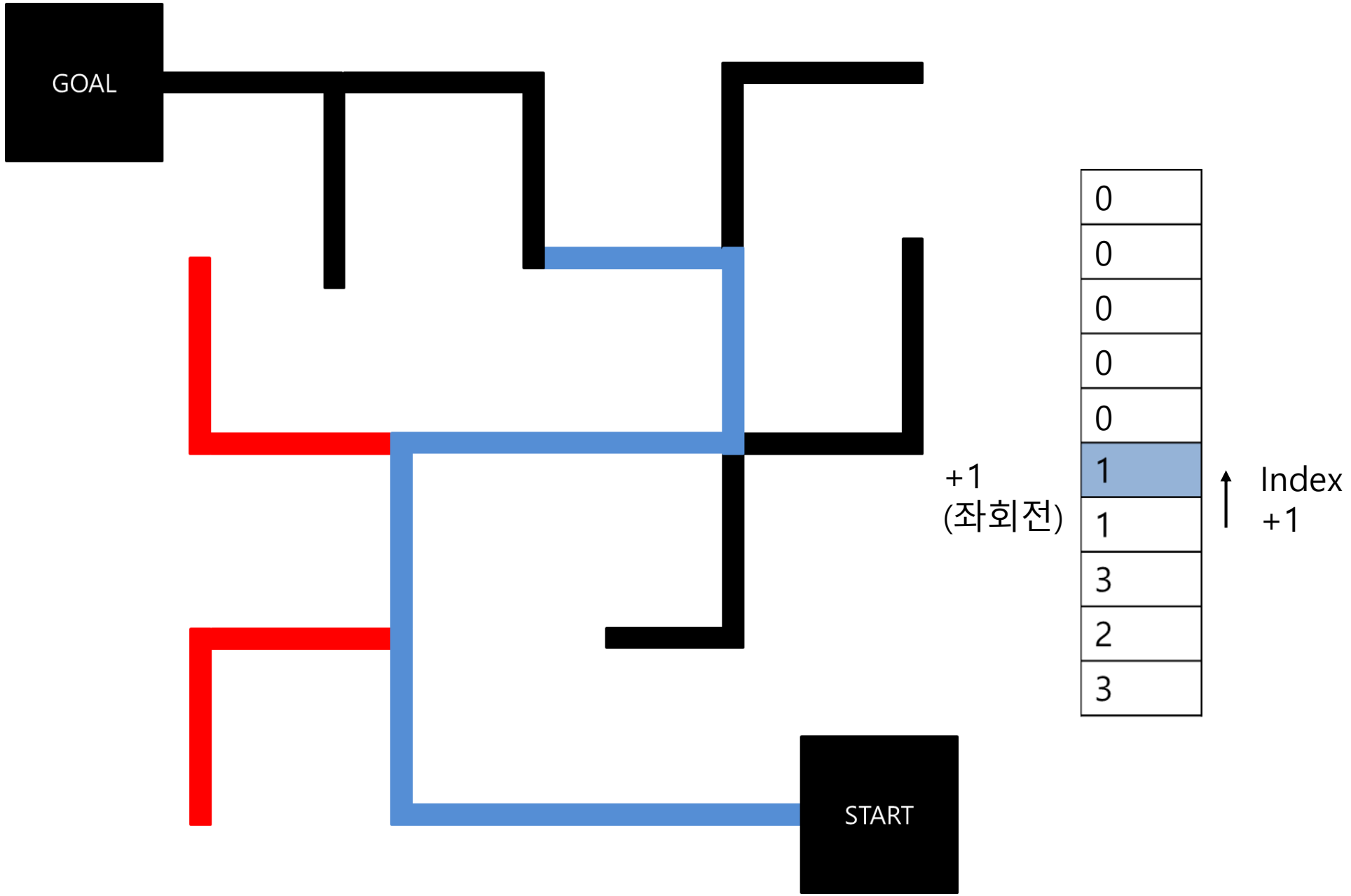
3
+1
(좌회전)
Index
+1


GOAL
START
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(좌회전)
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Index
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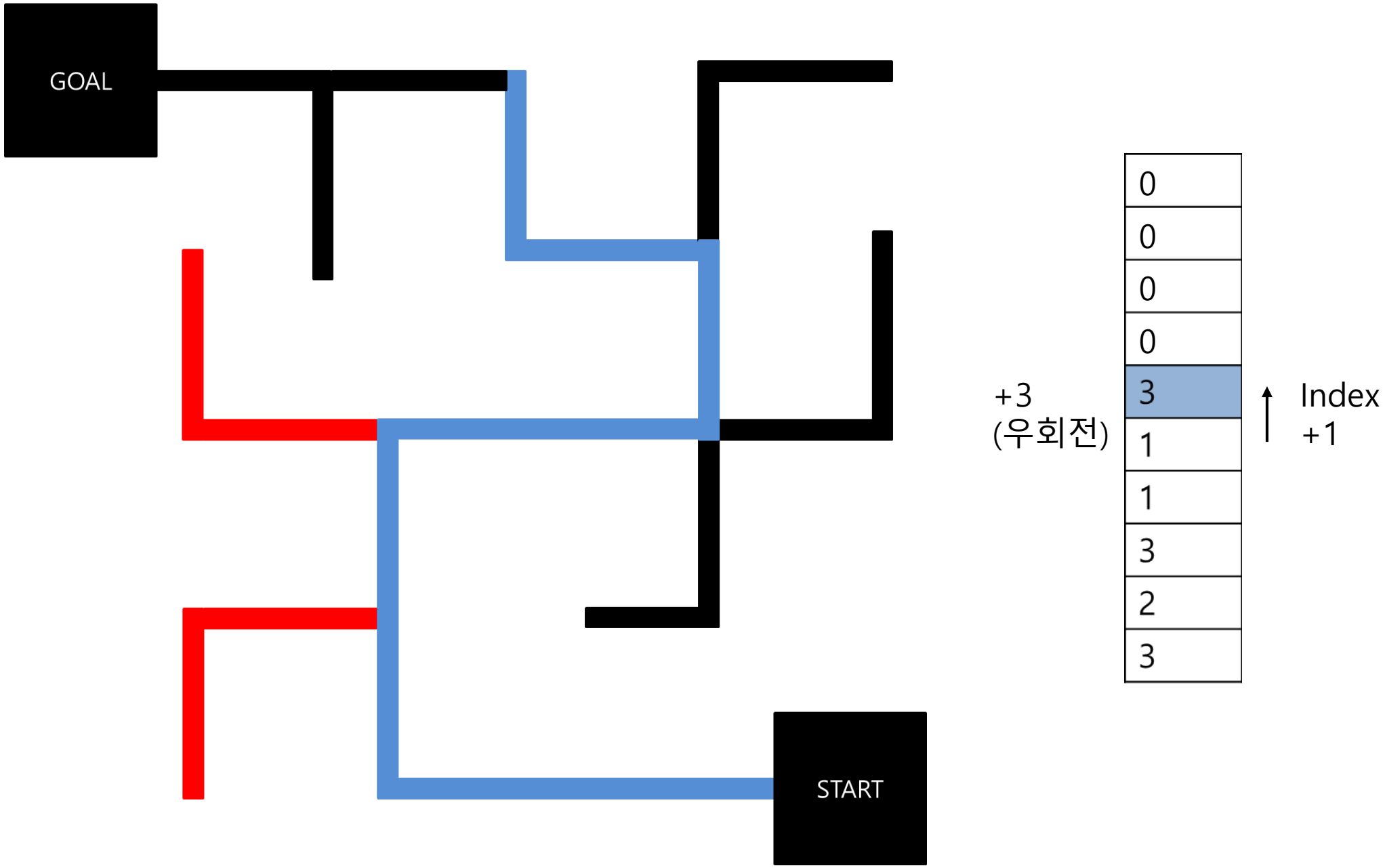
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START
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3
1
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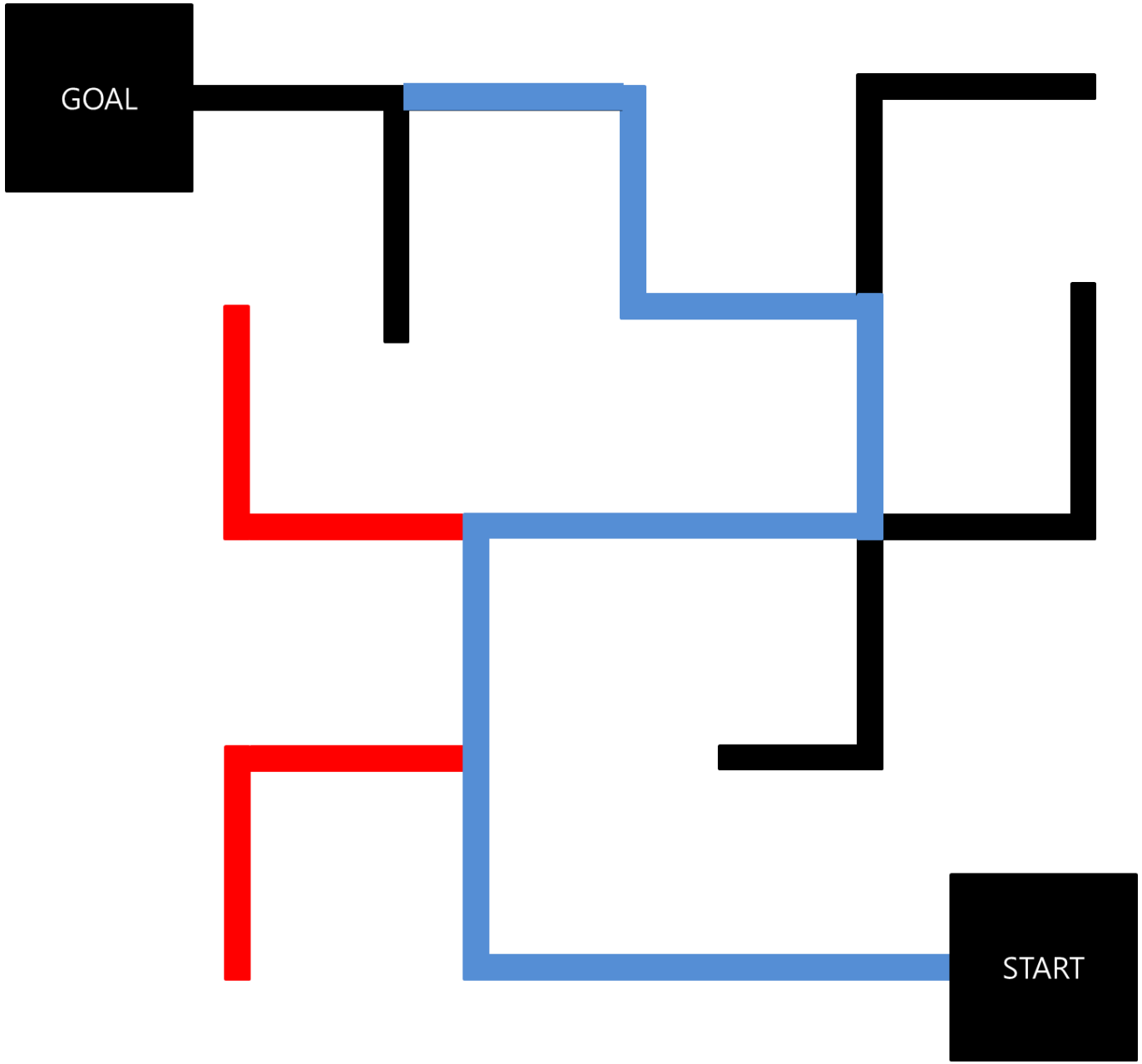
3
2
3
+3
(우회전)
Index
+1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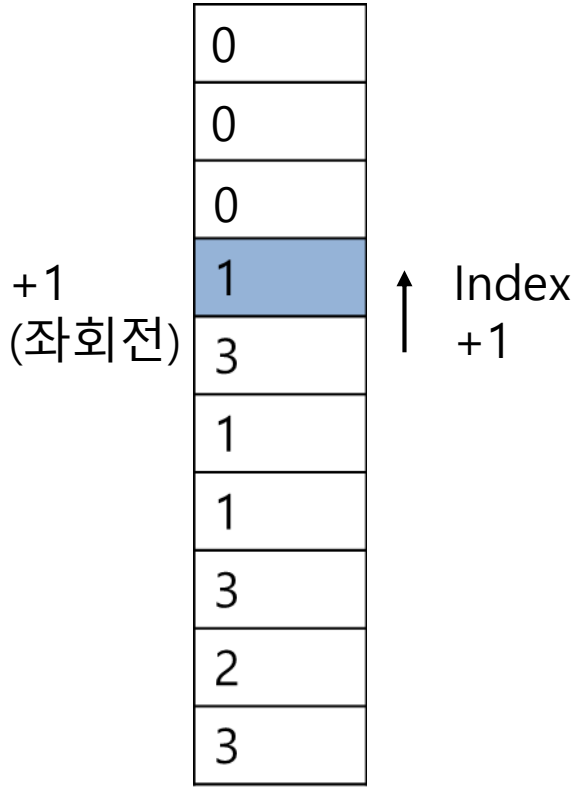
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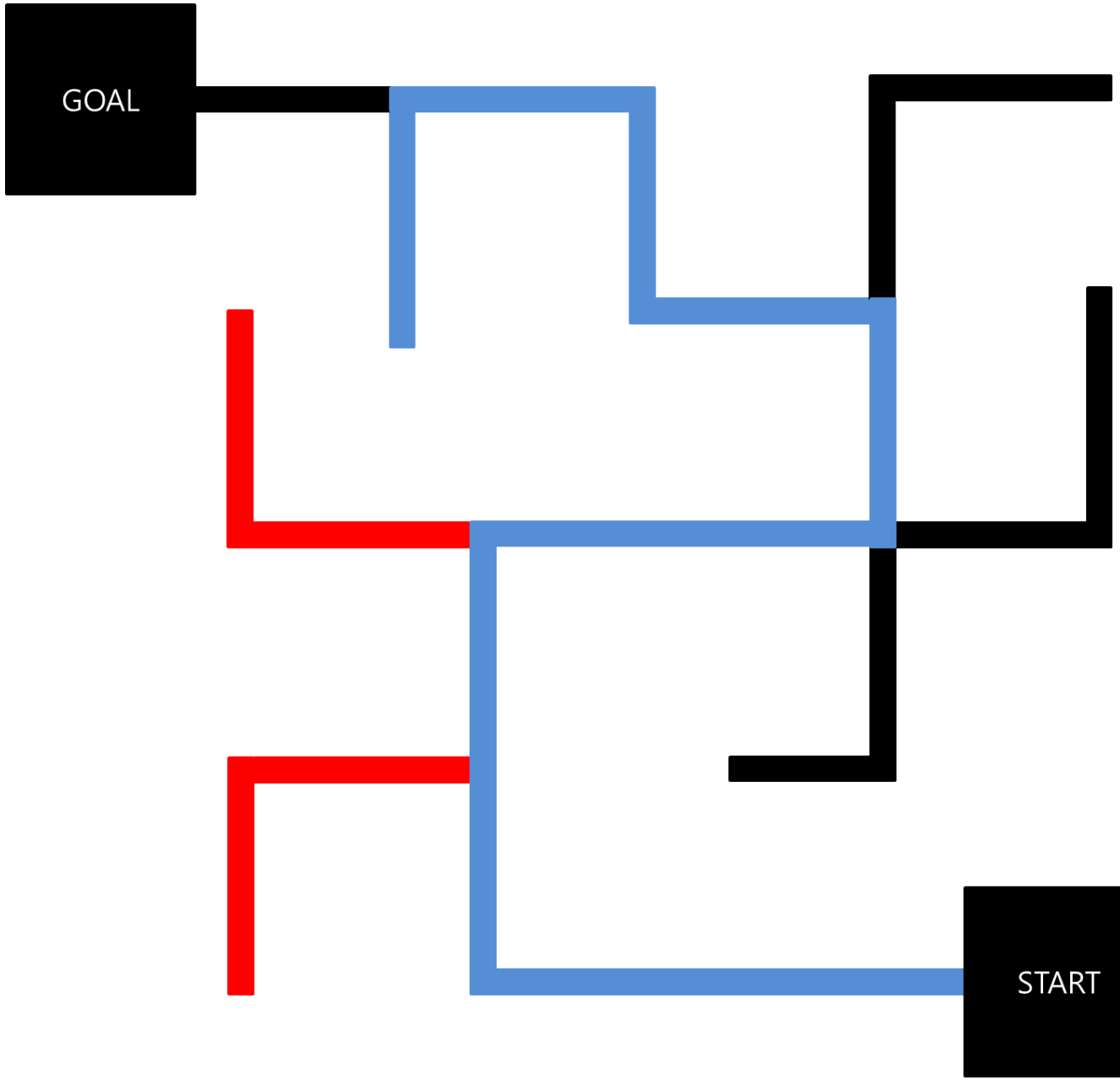
(좌회전)
Index
+1


GOAL
START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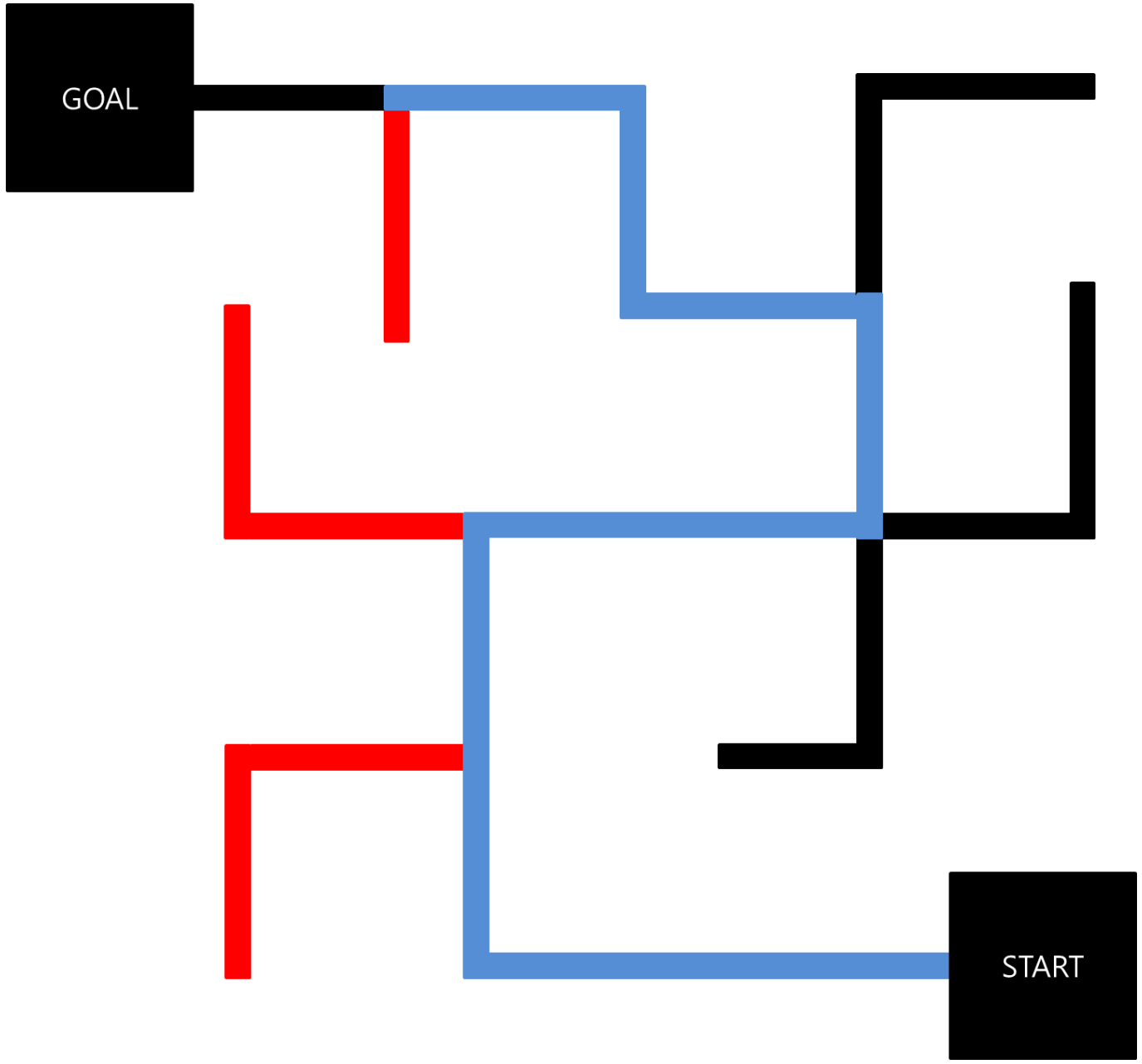
+1
(좌회전)
Index
+1



+4
(유턴)

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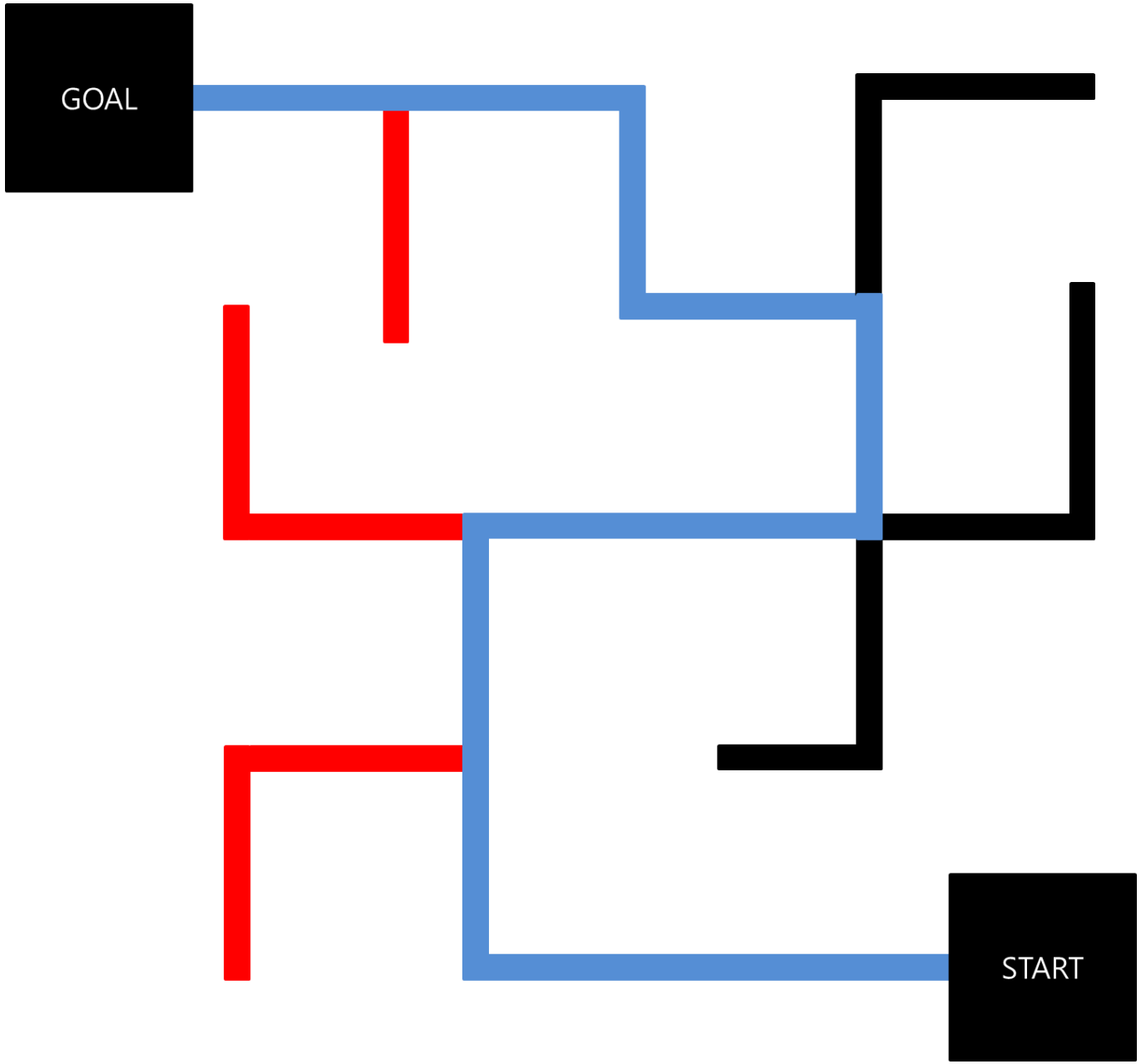
3

index
-2



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Index
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