

**CSCI1030 Hands-on Introduction to Java, Spring 2013**  
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The following shows the sample output of a complete run of the program. The **bold blue** text is user input and the other text is the program output.

```
Where is the Atom #1 ? Row: [1-8] Column: [1-8] ? 2 2↵
Where is the Atom #2 ? Row: [1-8] Column: [1-8] ? 4 6↵
Where is the Atom #3 ? Row: [1-8] Column: [1-8] ? 5 6↵
Where is the Atom #4 ? Row: [1-8] Column: [1-8] ? 7 2↵
      *TOP*
      1  2  3  4  5  6  7  8
    1  .  .  .  .  .  .  .  1
  * 2  .  @  .  .  .  .  2  *
  L 3  .  .  .  .  .  .  3  R
  E 4  .  .  .  .  .  @  4  I
  F 5  .  .  .  .  .  @  5  G
  T 6  .  .  .  .  .  .  6  H
  * 7  .  @  .  .  .  .  7  T
    8  .  .  .  .  .  .  8  *
      1  2  3  4  5  6  7  8
      *BOTTOM*
What is the ray position ? [1=TOP, 2=BOTTOM, 3=LEFT, 4=RIGHT, -1=EXIT] ? 2↵
Where should the ray start ? [1-8] ? 5↵
Starting Position: BOTTOM 5
Ray at Row:8,Col:5
Ray at Row:7,Col:5
Ray at Row:6,Col:5
--> Ray Deflected
Ray at Row:6,Col:4
Ray at Row:6,Col:3
--> Ray Deflected
Ray at Row:5,Col:3
Ray at Row:4,Col:3
Ray at Row:3,Col:3
--> Ray Deflected
Ray at Row:3,Col:4
Ray at Row:3,Col:5
--> Ray Deflected
Ray at Row:2,Col:5
Ray at Row:1,Col:5
Terminating Position: TOP 5
Outcome = Miss
      *TOP*
      1  2  3  4  5  6  7  8
    1  .  .  .  .  .  .  .  1
  * 2  .  @  .  .  .  .  2  *
  L 3  .  .  .  .  .  .  3  R
  E 4  .  .  .  .  .  @  4  I
  F 5  .  .  .  .  .  @  5  G
  T 6  .  .  .  .  .  .  6  H
  * 7  .  @  .  .  .  .  7  T
    8  .  .  .  .  .  .  8  *
      1  2  3  4  5  6  7  8
      *BOTTOM*
What is the ray position ? [1=TOP, 2=BOTTOM, 3=LEFT, 4=RIGHT, -1=EXIT] ? 1↵
Where should the ray start ? [1-8] ? 1↵
Starting Position: TOP 1
Ray at Row:1,Col:1
--> Ray Deflected
Terminating Position: LEFT 1
Outcome = Detour
```

```

      *TOP*
    1 2 3 4 5 6 7 8
  1 . . . . . . . 1
* 2 . @ . . . . . 2 *
L 3 . . . . . . . 3 R
E 4 . . . . . @ . . 4 I
F 5 . . . . . @ . . 5 G
T 6 . . . . . . . . 6 H
* 7 . @ . . . . . 7 T
  8 . . . . . . . 8 *
    1 2 3 4 5 6 7 8
      *BOTTOM*

```

What is the ray position ? [1=TOP, 2=BOTTOM, 3=LEFT, 4=RIGHT, -1=EXIT] ? 3↵

Where should the ray start ? [1-8] ? 3↵

Starting Position: LEFT 3

Ray at Row:3,Col:1

--> Ray Deflected

Ray at Row:4,Col:1

Ray at Row:5,Col:1

Ray at Row:6,Col:1

--> Ray Deflected

Terminating Position: LEFT 6

Outcome = Detour

```

      *TOP*
    1 2 3 4 5 6 7 8
  1 . . . . . . . 1
* 2 . @ . . . . . 2 *
L 3 . . . . . . . 3 R
E 4 . . . . . @ . . 4 I
F 5 . . . . . @ . . 5 G
T 6 . . . . . . . . 6 H
* 7 . @ . . . . . 7 T
  8 . . . . . . . 8 *
    1 2 3 4 5 6 7 8
      *BOTTOM*

```

What is the ray position ? [1=TOP, 2=BOTTOM, 3=LEFT, 4=RIGHT, -1=EXIT] ? 2↵

Where should the ray start ? [1-8] ? 3↵

Starting Position: BOTTOM 3

Ray at Row:8,Col:3

--> Ray Deflected

Ray at Row:8,Col:4

Ray at Row:8,Col:5

Ray at Row:8,Col:6

Ray at Row:8,Col:7

Ray at Row:8,Col:8

Terminating Position: RIGHT 8

Outcome = Detour

```

      *TOP*
    1 2 3 4 5 6 7 8
  1 . . . . . . . 1
* 2 . @ . . . . . 2 *
L 3 . . . . . . . 3 R
E 4 . . . . . @ . . 4 I
F 5 . . . . . @ . . 5 G
T 6 . . . . . . . . 6 H
* 7 . @ . . . . . 7 T
  8 . . . . . . . 8 *
    1 2 3 4 5 6 7 8
      *BOTTOM*

```

What is the ray position ? [1=TOP, 2=BOTTOM, 3=LEFT, 4=RIGHT, -1=EXIT] ? 1↵

Where should the ray start ? [1-8] ? 4↵

Starting Position: TOP 4

Ray at Row:1,Col:4

Ray at Row:2,Col:4

Ray at Row:3,Col:4

Ray at Row:4,Col:4

Ray at Row:5,Col:4

Ray at Row:6,Col:4

Ray at Row:7,Col:4

Ray at Row:8,Col:4

Terminating Position: BOTTOM 4

Outcome = Miss

```

      *TOP*
      1  2  3  4  5  6  7  8
1  .  .  .  .  .  .  .  .  1
* 2  .  @  .  .  .  .  .  2  *
L 3  .  .  .  .  .  .  .  3  R
E 4  .  .  .  .  .  @  .  4  I
F 5  .  .  .  .  .  @  .  5  G
T 6  .  .  .  .  .  .  .  6  H
* 7  .  @  .  .  .  .  .  7  T
  8  .  .  .  .  .  .  .  8  *
      1  2  3  4  5  6  7  8
      *BOTTOM*
  
```

What is the ray position ? [1=TOP, 2=BOTTOM, 3=LEFT, 4=RIGHT, -1=EXIT] ? 1↵

Where should the ray start ? [1-8] ? 6↵

Starting Position: TOP 6

Ray at Row:1,Col:6

Ray at Row:2,Col:6

Ray at Row:3,Col:6

--> Ray Absorbed

Terminating Position: Not Available

Outcome = Hit

```

      *TOP*
      1  2  3  4  5  6  7  8
1  .  .  .  .  .  .  .  .  1
* 2  .  @  .  .  .  .  .  2  *
L 3  .  .  .  .  .  .  .  3  R
E 4  .  .  .  .  .  @  .  4  I
F 5  .  .  .  .  .  @  .  5  G
T 6  .  .  .  .  .  .  .  6  H
* 7  .  @  .  .  .  .  .  7  T
  8  .  .  .  .  .  .  .  8  *
      1  2  3  4  5  6  7  8
      *BOTTOM*
  
```

What is the ray position ? [1=TOP, 2=BOTTOM, 3=LEFT, 4=RIGHT, -1=EXIT] ? -1↵

Bye!