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 8↵
Where is the Atom #2 ? Row:[1-8] Column:[1-8] ? 5 3↵
Where is the Atom #3 ? Row:[1-8] Column:[1-8] ? 7 3↵
Where is the Atom #4 ? Row:[1-8] Column:[1-8] ? 7 7↵
              *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] ? 4↵
Where should the ray start ? [1-8] ? 5↵
Staring Position: RIGHT 5
Ray at Row:5,Col:8
Ray at Row:5,Col:7
Ray at Row:5,Col:6
Ray at Row:5,Col:5
Ray at Row:5,Col:4
--> 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] ? 4↵
Where should the ray start ? [1-8] ? 3↵
Staring Position: RIGHT 3
Ray at Row:3,Col:8
--> Ray Reflected
Ray at Row:3,Col:8
Terminating Position: RIGHT 3
Outcome = Reflection
              *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] ? 6↵
Staring Position: LEFT 6
Ray at Row:6,Col:1
Ray at Row:6,Col:2
--> Ray Reflected
Ray at Row:6,Col:2
Ray at Row:6,Col:1
Terminating Position: LEFT 6
Outcome = Reflection
              *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↵
Staring 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 Deflected
Ray at Row:4,Col:5
Ray at Row:4,Col:6
Ray at Row:4,Col:7
Ray at Row:4,Col:8
Terminating Position: RIGHT 4
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] ? 4↵
Staring Position: BOTTOM 4
Ray at Row:8,Col:4
--> Ray Deflected
Ray at Row:8,Col:5
Ray at Row:8,Col:6
--> Ray Deflected
Terminating Position: BOTTOM 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] ? 4↵
Where should the ray start ? [1-8] ? 6↵
Staring Position: RIGHT 6
Ray at Row:6,Col:8
--> Ray Deflected
Ray at Row:5,Col:8
Ray at Row:4,Col:8
Ray at Row:3,Col:8
--> 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↵
Where should the ray start ? [1-8] ? 5↵
Staring Position: TOP 5
Ray at Row:1,Col:5
Ray at Row:2,Col:5
Ray at Row:3,Col:5
Ray at Row:4,Col:5
Ray at Row:5,Col:5
Ray at Row:6,Col:5
Ray at Row:7,Col:5
Ray at Row:8,Col:5
Terminating Position: BOTTOM 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] ? 6↵
Staring Position: TOP 6
Ray at Row:1,Col:6
Ray at Row:2,Col:6
Ray at Row:3,Col:6
Ray at Row:4,Col:6
Ray at Row:5,Col:6
Ray at Row:6,Col:6
--> Ray Deflected
Ray at Row:6,Col:5
Ray at Row:6,Col:4
--> Ray Reflected
Ray at Row:6,Col:4
Ray at Row:6,Col:5
Ray at Row:6,Col:6
--> Ray Deflected
Ray at Row:5,Col:6
Ray at Row:4,Col:6
Ray at Row:3,Col:6
Ray at Row:2,Col:6
Ray at Row:1,Col:6
Terminating Position: TOP 6
Outcome = Reflection
              *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!
```