1.4 Programming

1. **Sprinklers** (20 pts)
   Implement the sprinkler algorithm you constructed above. Your Java program should accept input from standard-input, i.e. `System.in` in the following format:

   - the first line contains the three numbers you need:

     $$L \;\; W \;\; N$$

     separated by whitespace (a blank). Note that

     $$L \in \mathbb{R} \mid 0 \leq L \leq 2^{20}$$

     $$W \in \mathbb{R} \mid 0 \leq L \leq 2^{20}$$

     $$N \in \mathbb{N} \mid 0 \leq N \leq 2^{16}$$

   - the next N lines describe a sprinkler with two numbers

     $$p_i \;\; r_i$$

     separated by whitespace (a blank). Note that

     $$p_i \in \mathbb{R} \mid 0 \leq p_i \leq L \text{ for all } 0 < i \leq N$$

     $$r_i \in \mathbb{R} \mid 0 \leq r_i \leq 2^{22}$$

   Your output should be emitted to standard-output, i.e. `System.out` and consist of one line containing the minimum number of sprinklers needed, or just the word `impossible`.

   You must follow good development practices, including writing down a number of illustrative test cases **before** writing any code.

Here are a few which you can see in the images below:

```
2.0 2.0 1
1.0 1.0
```
→ `impossible`

```
2.0 2.0 1
1.0 2.0
```
→ `1`

```
2.0 2.0 2
0.0 2.0
1.5 1.5
```
→ `2`

```
3.0 2.0 2
1.0 2.0
1.5 1.5
```
→ `impossible`

```
3.0 2.0 3
1.0 2.0
1.5 1.5
2.0 2.0
```
→ `2`