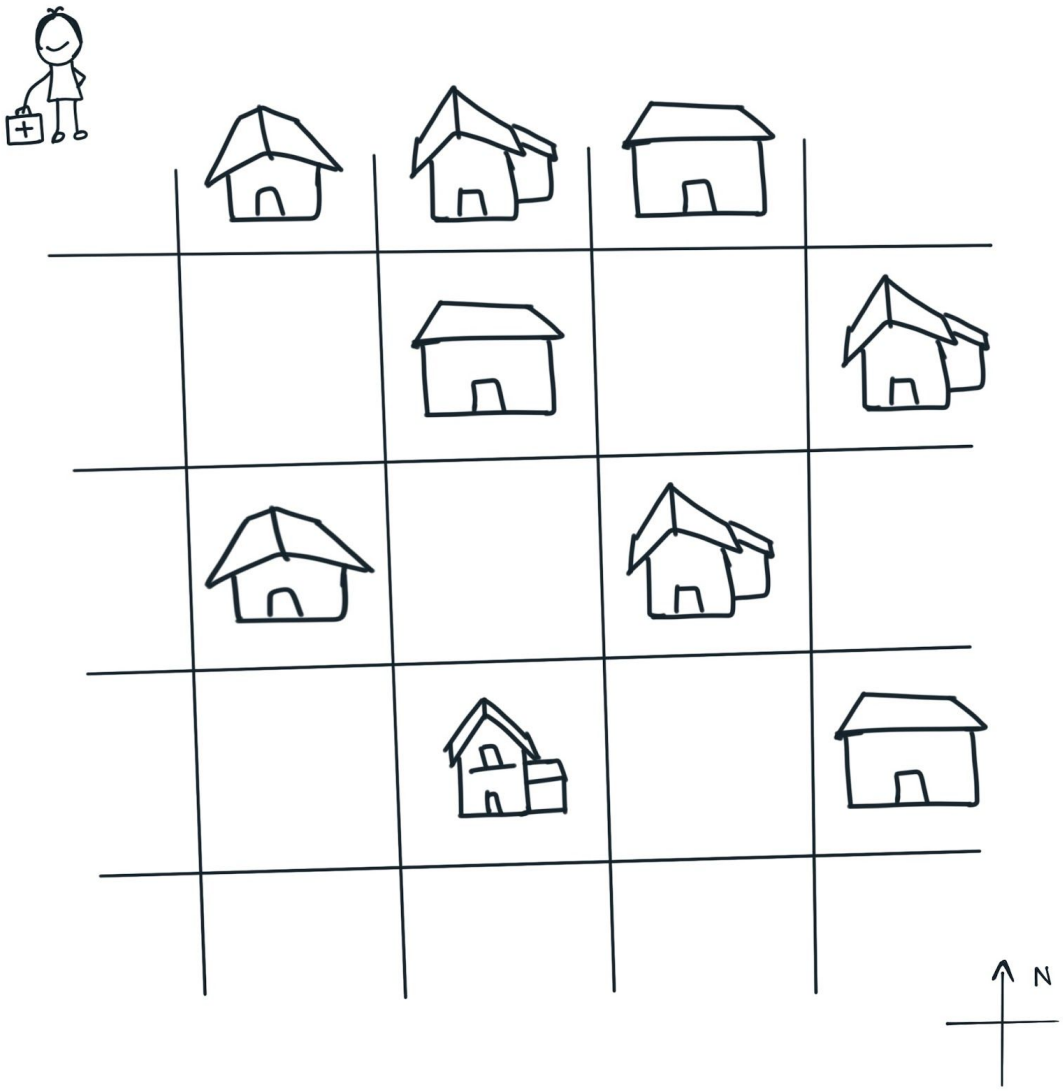
Safe Route Navigator

Problem Statement

In a world stuck by pandemic, you are a software wizard helping the front line health workers to fight the virus with your software by giving them a safe route navigation system.



TARKA
_LABS

Key characteristics

- This town is designed as grid in which each cell has only one house
- House door numbers start from North West (top left in the above image) and are sequentially numbered row wise
- If any grid is vacant (house not yet built), the door numbers will be skipped
- Section of the road facing the quarantined house entrance will be blocked access to avoid further spread of virus
- Surprisingly, All the entrances of these houses face south
- Health worker will always start from North West facing South

Task

Build a program that will help the front line workers to safely reach the destination house without going through the blocked / quarantined roads

Your program should accept the following inputs:

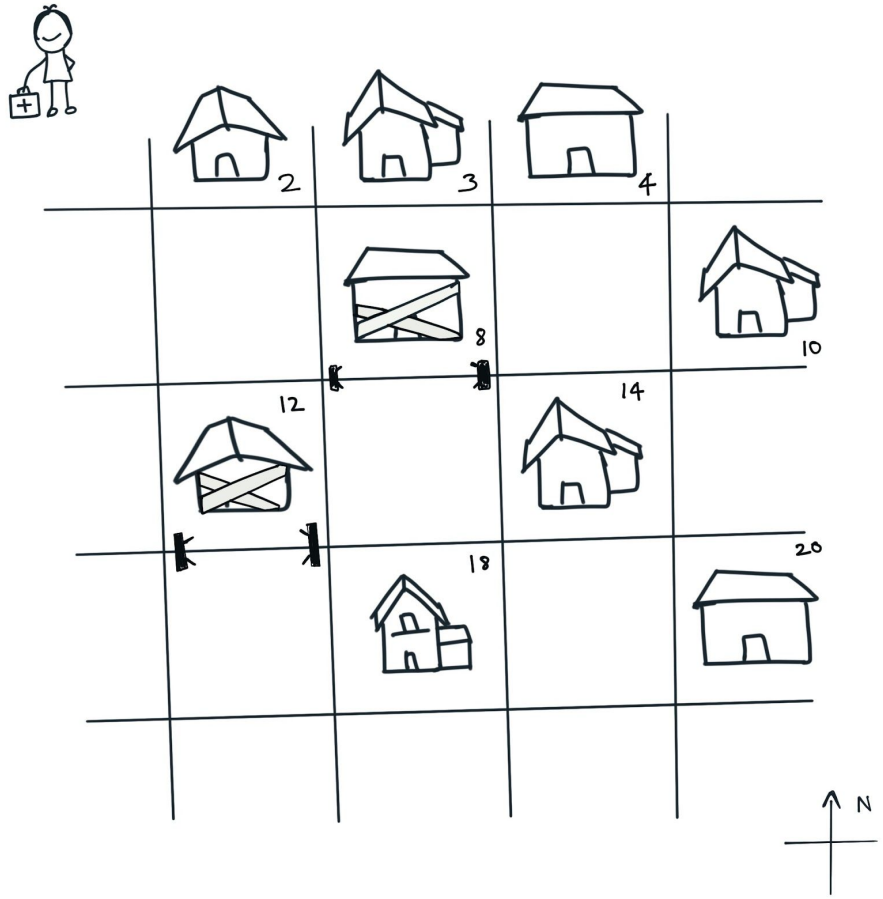
- Size of the grid as an array of 2 values
- Quarantined House numbers as an array
- Destination House number

And return the navigation steps as a string containing the letters

- **F** to go forward one cell
- **R** to take a right turn
- **L** to take a left turn

Example

Let us take the following scenario



The houses **8** and **12** are quarantined. And the health worker is expected to reach house number **14**

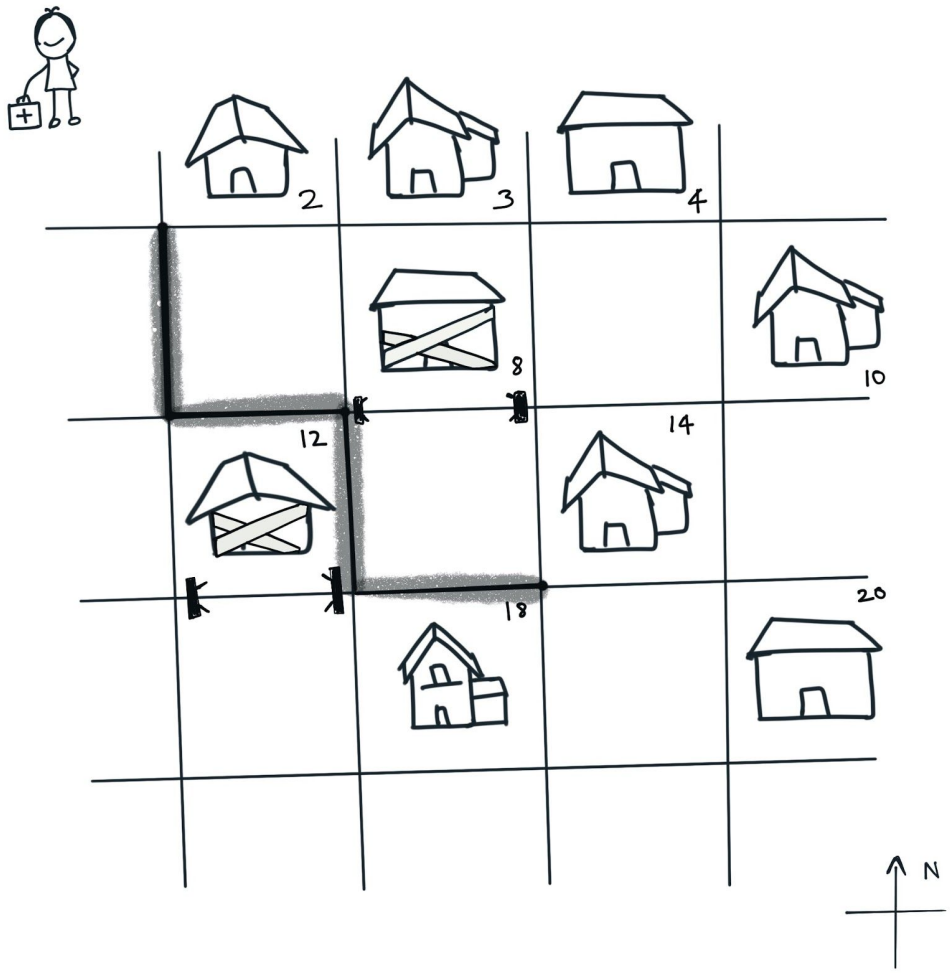
The inputs to this scenario will be

- Parameter 1, the size of the grid : **[5, 5]**
- Parameter 2, the houses quarantined : **[8, 12]**
- Parameter 3, the destination house number : **14**

Expected output: **FLFRFLF**

Explanation

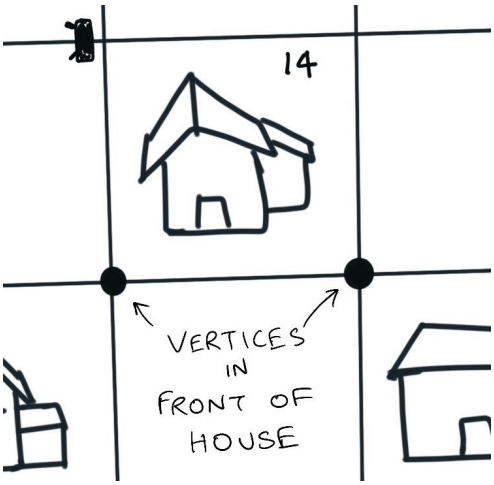
The health worker starts his initial position on the top left point in the grid facing south. He/She moves 1 house forward (**F**) and then turns left (**L**) and moves one house forward (**F**). Then, he turns right (**R**) and moves one house forward (**F**) and again turns left (**L**) and moves one more house forward (**F**) to reach the house no 14 (vertex)



Visualization of the health worker's path

Note 1 : There could be more than one possible route to reach the destination. It is enough if your program can output one valid route

Note 2 : It is enough for the navigation system to give directions to reach either vertex of the house front.



Note 3 : Extra points if your program can figure out the shortest route (lesser number of steps) and always return that

Note 4 : There could be cases where there is no way for the health worker to reach the destination. In that case, your program should return the string “Unreachable Destination”

Guidelines

1. You can choose a programming language of your choice. Picking a web development language will be a plus
2. You can upload your solution in a cloud version control like github / Send the files as zip to us
3. Your program should execute for different inputs and return expected output
4. Code should be understandable and written with good programming practices in mind like (but not limited to)
    a. Meaningful variable and function / class names

    b. Separation of concerns
    c. High cohesion, Low coupling
    d. Comments to explain the “why” part instead of “what” the code is doing

5. If your solution gets selected, there will be a part 2 to this problem where you will be pairing with one of us to extend your solution and make it work