Weekly report 15
Kia Kafaei 19/2-2021

What did I do this week?

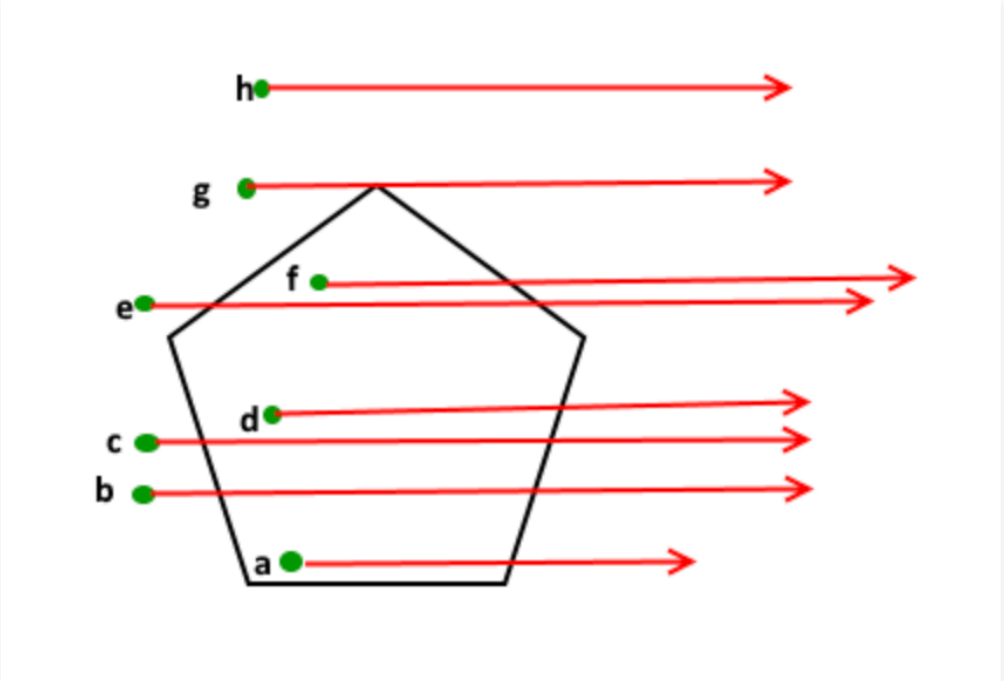
The task this week was to make a flowchart of the program and look into how to make sure that the path doesn't go outside the building.

Challenges

I first looked into ways to make sure that the path doesn't include the outside of the building based on the information we have about the rooms. For each room we have the line coordinates that make up the walls of the room.

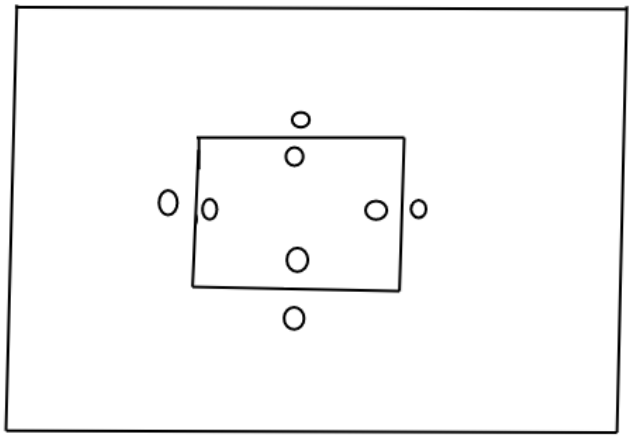
I found a way using an algorithm roughly illustrated below. This algorithm finds out whether a node is inside the building or outside the building. This could be used on every single node in the grid but that would probably lead to very poor performance.

A smarter way to do this is to use this algorithm on every door node; removing each door that is not inside the building. This should be enough to make sure that the path doesn't go outside the building.



One case where this algorithm would fail is in the example building below. Since the doors that are outside the building - the doors that are in the small square area in the center - will meet walls in every direction and the algorithm would therefore not be able to detect that they are outside the building.

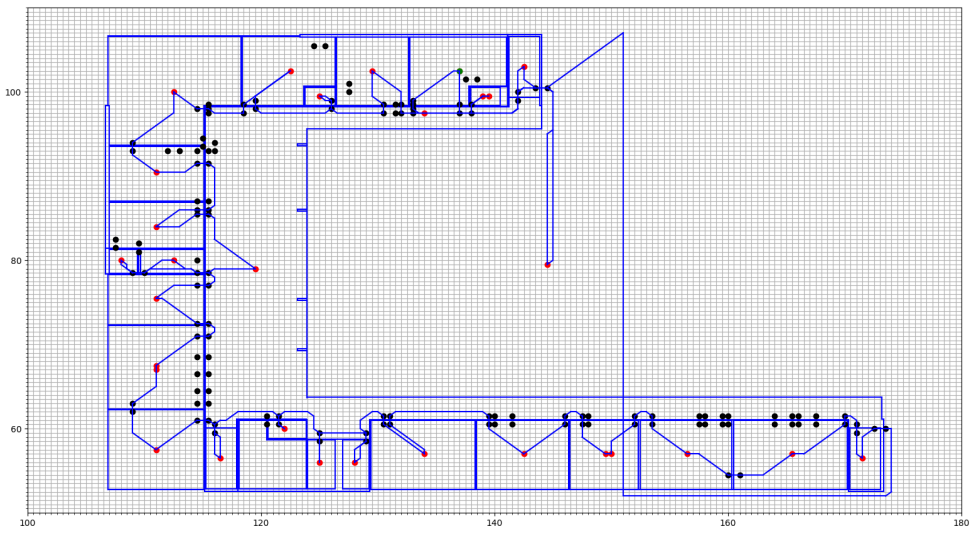
This is a very rare case and my thought is that if this is indeed the case, the doors would had to be removed manually.

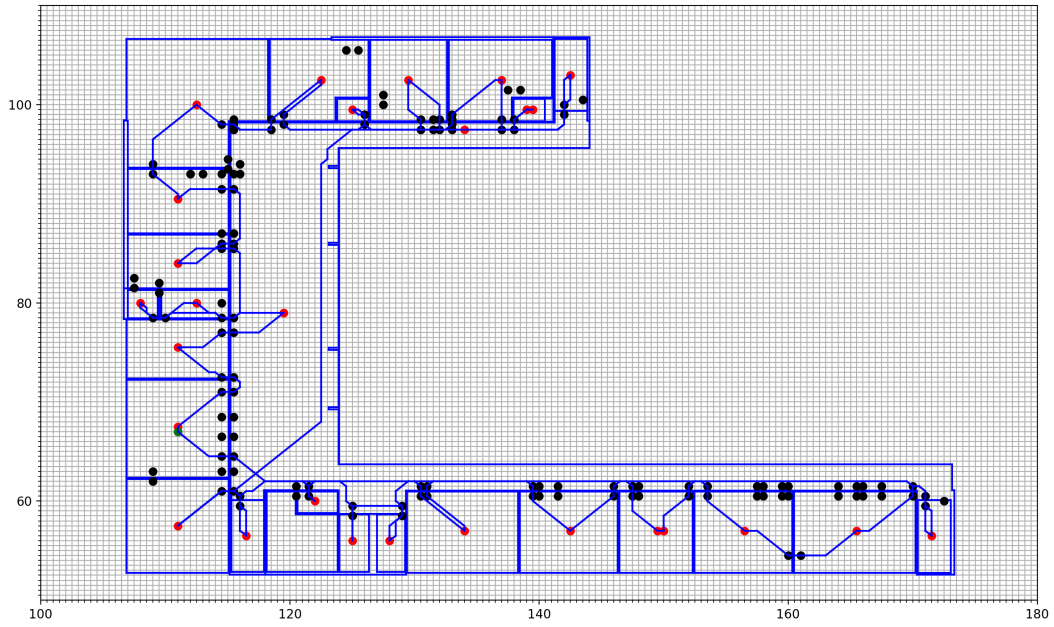


I should mention that I haven't actually written the code for the algorithm yet since I wanted to hear your opinions on it first. Maybe you guys know better ways to do it.

Example of removing doors manually

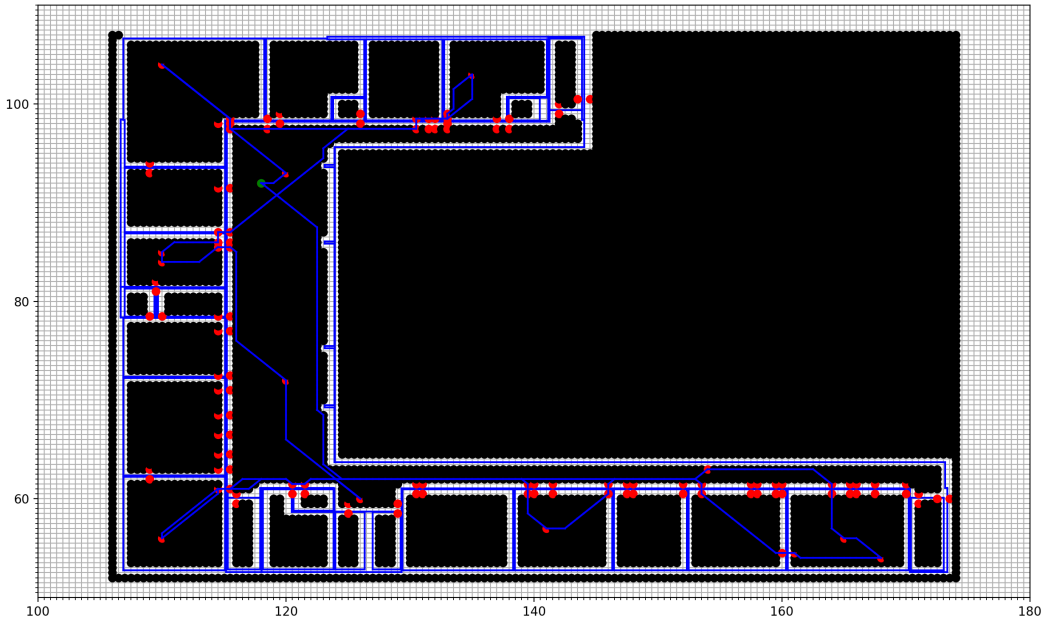
The first figure below show the path where the outside doors have not been removed, and the second figure shows the path where these doors have been removed.





Showing the grid nodes

Below is a figure where all the grid nodes have been made visible. They are marked as black points while the door and room nodes are marked as red.



What should I do next week?

- Unless you have better ideas I will implement the algorithm described earlier.

Questions

What should be my next move after this? Should I start testing on different buildings now with what I have got or should I try to implement some sort of optimisation algorithm for generating the nodes in the rooms?