IMPROBABLE

Games & Enterprise Engineering
Remote Collaborative Exercise

Logistics

You will be meeting with one of our engineers.

We will use Google Hangouts to conduct the interview together with a browser-based online code collaboration system - https://www.hackerrank.com and another browser-based tool to aid with the visualization of your solution.

The exercise will take around an hour and there will be plenty of time at the end for you to chat in more detail about what our engineers get up to!

Exercise Brief

One of the common problems faced by massive virtual worlds is the creation of large amounts of content to populate them. For example, a game involving a large number of urban areas might require unique, 'believable' road networks too expensive to each create by hand. One option is therefore to generate this content algorithmically.

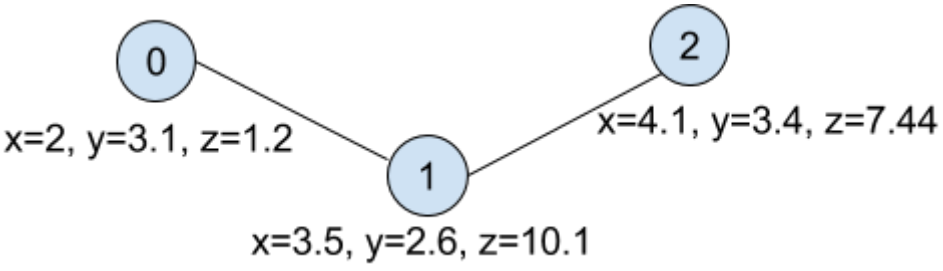
In this exercise we are asking you to design and write some code/algorithm which generates a road network for use in a virtual city.

We generally represent a network as a set of nodes, and a set of edges that link pairs of nodes. Each node in your graph should be associated with a location in three-dimensional space (with the third dimension being height or altitude).

Your program should write a list of node locations to the console, in the following format:

- Each node location should be printed on a new line
- Each node location should be formatted as three numbers separated by commas (e.g. 1,2.1,5.0)
- All node locations should be printed before any edge descriptions
- Each edge description should be printed on a new line
- Each edge should be formatted as two integers separated by commas, each integer being an index into the preceding list of node locations
- Edge indices start at zero

For example, to achieve a graph like this:



Your output would be:

```
2, 3.1, 1.2
3.5, 2.6, 10.1
4.1, 3.4, 7.44
0, 1
1, 2
```

Other Notes

You can use any programming language, however you should be prepared to provide reasons for your choice and have enough proficiency to guide another engineer through your solution who may not be familiar with the language.

During the exercise we will give you access to a web-based visualization tool which can be used to generate a visualization of the network that your program generates.

The focus of the interview will be on your ability to create interesting, believable results within the hour-long session. You are welcome to think about, or even attempt, possible solutions prior to the session, but keep in mind that when the session begins you will be expected to code from scratch.

We will also be interested in your thoughts on how your network generation code could be generalised to content other than typical city road networks.

Note that HackerRank is somewhat restricted in the imports and libraries it has access to - you're welcome to experiment prior the interview.