# Programming Questions

For all questions, please write your own code.

Consider the following class definition:

public class Node {  
 List<Node> children;  
}

Imagine that there are “no loops” in this data structure at runtime. An example of the data structure might look like:

### Question 1:

Write a function to determine the maximum path length from the root node to the most distant remote node. In the case above the most distant remote node is e and the max path length is 3 (a->b, b->d and d->e).

### Question 2:

How good is this function? Can you quantify how good or bad it is? If a developer in your team presented it to you, what would your concerns be if any and how would you figure out if the solution was acceptable?

### Question 3:

Let’s say we removed the “no loops” guarantee, can you write a function to determine whether or not the structure contains a loop?