

Testing

3 good reasons to write test cases

Tests help keep track of what is stable and what is no longer stable, they help with maintainability, especially if another dev takes over the project and test cases help with debugging.

Mocks

Mocks are used to simulate the behaviour of a unit that is either unfinished, or difficult/impossible to implement in end to end testing.

Two advantages and two disadvantages of mocking

Mocks can be used to unit test sections of code without relying on other sections and they can also be used to create demos. However a mock isn't totally accurate and may lack the complexity of a live environment. Used improperly mocks will add extra unnecessary complexity to the code

Where should mocks generally be used

Mocks should generally be used when a dependency of the program is unfinished, and the developer wants to run unit tests. Regardless of if they are just testing or if they are following test-driven development practices.

Insufficient code testing leading to problems

The explosion of the Ariane 5 was caused by a velocity reading of a 64 bit floating point number being converted to a 16 bit signed integer. The number was larger than 32,767, the conversion failed and the Ariane began its self-destruct sequence (N. Arnold, 2000).

Solver

BFS finds the shortest route from a to b, that is all it does, if you want to map or find information about the structure and connections of/in a graph use DFS.

DFS is fast and can be used to do more than just find a route. e.g. topological mapping and number of connections. DFS also uses less memory than BFS.

In a maze where the end is very close to the start BFS could be faster than DFS. For example if the goal is one cell to the right and DFS checks left first then BFS will be faster.

```
*****
*      XY*
* *****
*  *
*  *
*  *
*  *
*  *
***
```

Why can't you use a list of visited cells

My solver does use a visited list.

A **single** list of visited cells can't be used because of the water buckets. If a water bucket is at a corridor or a water bucket is picked up after a fire space has already been visited the solver will be unable to find a solution. E.g.

Y

F

X

W

However a list of visited cells can be used if it is cleared or a new one is created when water is picked up. To do this a local visited list must be created each time a game state picks up a water bucket.

Baraniuk, C., 2015. *The Number Glitch That Can Lead To Catastrophe*. [online] Bbc.com. Available at: <<https://www.bbc.com/future/article/20150505-the-numbers-that-lead-to-disaster>> [Accessed 29 May 2020].