

INFO-1110 Arcon assignment Report

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1 Game Testing

1.1 Advantage for writing test cases

- Designing test cases before you start testing can avoid blind testing and improve testing efficiency
- Help verify that the program meets the requirements and discover potential bugs by expanding test coverage.
- Help explore the program in different aspect and give insight to further improve the program.

1.2 Mock test

- Mock test is a test method that uses a virtual object to create test methods for some objects that are not easy to construct or get. For instance, Design an alarm reminder service to play audio files after 5 pm. We can simulate control time by test with mock objects, rather than wait until 5 p.m..

1.2.1 Advantage

- Mock isolation can avoid the interference between different modules and prevent the test error of one module caused by the error of other system modules.
- Teams can work in parallel without interacting with each other during development, as long as the interfaces are well defined by both sides of the interaction.

1.2.2 Disadvantage

- Mock may hide errors and defects in simulated virtual object.
- Mock testing can add unnecessary complexity to the code, as the code design became a messy network of objects that communicate in a complex way.

1.2.3 Suitable test for Mock

- Mock test usually used for unit test.

1.3 Insufficient code testing led to problems

- When NASA building its Mars Climate Orbiter, an engineering team used English units, not the intended metric units. This causes the thruster of the detector to not work properly and the probe crashed vertically from a height of 130 feet from the surface of Mars in 1999.

2 Solver

2.1 Strengths and Weaknesses of the BFS

- BFS stores every adjacent node it processes in the queue, so it can be construct the shortest path from Start to End in the game board.
- BFS has memory constraints as it stores all the nodes of the present step to go for the next step, so it consumes time if the End is far away.
- BFS is more suitable for small or medium board or a large board with frequent solution.

2.2 Strengths and Weaknesses of the DFS

- DFS's memory requirement is only linear, so less time consumes and space complexity rather than BFS and solution can be found out by without much more search.
- DFS doesn't always provide the optimal shortest move and it is less efficient when dueling with a board with higher complexity.
- DFS is more suitable for large board with rare solution.

2.3 Ending cell close to Starting cell

- DFS usually has less time consumption, but if the End cell is very close to Starting cell, BFS and DFS should have similar time-consuming.

2.4 BFS, DFS algorithms and Game Feature:

- Water became necessary items for the board with fire obstacles and the water buckets might locate in a room. The player should be able to step in and out of the room for collecting water buckets , so they have to step in the cell that they visited before. Therefore, created a visited list to prevent re-visiting a cell to perform BFS or DFS faster is not suitable.

3 Reference

- En.wikipedia.org. 2020. Mars Climate Orbiter. [online] Available at: https://en.wikipedia.org/wiki/Mars_Climate_Orbiter [Accessed 28 May 2020].