Project 3 — Balloon Juice

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Contents

1   Precursor Information

1. Members: Mason Godfrey, Jared Dyreson

2. Class: CS-335, Section 02

3. Team Name: Jurrito

2   Introduction

This project focuses on a mission reconnaissance visualizer, showing a bot retrieve a balloon in a deeply nested balloon field. The mission is to traverse from balloon to balloon, leaving markers of where it has been in the process. Our bot has a very simple set of instructions and rules it must adhere to. Those are as follows:

1. The bot must move forward once and cannot repeat such action after the fact. That path is considered dead.

2. The bot can go backwards and follows the same principle as the rule above.

3. Teleportation is not permitted

4. The bot will finally show it's path taken in reverse order, making it's way back to the initial balloon.

In this project, we have the balloon field initialized to an $V \times V$ adjacency matrix, where V is defined as the number of balloons occupying the field (here we have 40).

2.1   Floyd-Warshall Algorithm

The algorithm will find the shortest path given a matrix with weighted edges, where the connection spanning from $u \to v$ signifies an edge or connection. These edge values are then used to find the lengths of said shortest path. By design, the algorithm does not attempt to reconstruct the path but in our rendition it does. The average running time of this algorithm is $\theta(|V^3|)$.

3 Archive Contents

3.1 documentation

- exported/Balloon-Juice.pdf — PDF rendition of our documentation

- Balloon-Juice.tex — LaTeX version of our documentation

- Balloon-Juice.txt — plain text version of our documentation (directly converted from above using pandoc). If viewing in plain text, please consider checking out the PDF for the images to be displayed in line. Otherwise, please navigate to "assets" to see them; nomenclature of the file names should be self-explanatory.

- assets/ — all images pertaining to this documentation piece

3.2 root

- Display.js — All drawing functionality that is conducted by p5

- index.html — webpage to display all the drawing

- README.txt — the plain text version of this document

- RuntimeAnalysis.txt — plain text version of our running time analysis

3.3 runtime

- assets/p5.js — this file is considered an import and has been given by Professor Siska

- backend/Bot.js — contains logic for the bot that traverses the balloon field (remove randomGenerator)

- backend/GenPoint.js — randomly generates balloons in the balloon field, ensuring they have proper DPV values

- graphics/Balloon.js — a balloon and balloon field class implementation that controls the graphical movement of the balloons

- graphics/Cell.js — a graphical representation of the balloons that get displayed onto the screen

- graphics/DPV.js — helps control the logic behind the generation of balloons
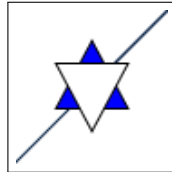
4   Installation and Running

1. Extract the .zip file into a folder

2. Navigate to the driver.html file within the folder. Right-click on the file and select "Open". The p5 program should start immediately. A field of balloons should appear and the algorithm should start displaying the path taken.

4.1   Icon Legend

Starting Node
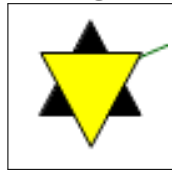
Ending Node

5   Known Bugs

Currently there are no known bugs to exist nor undesired program outcomes. However, we were not able to complete the table visualization of our Floyd-Warshal algorithm as there were several overlapping bugs and no time to address. Therefore we have printed the entire traversal through the console and can be examined there.

6   Testing

The team has not experience any warnings or ill side effects from running Balloon-Juice.

7 Credits

Jared:

1. Floyd-Warshall Algorithm