

Algorithm Visualization Second Iteration Report

Casey Davis, Johnathan Mell, Di Mu, Federico Nusymowicz

`{davisca, jmell, dimu, fnusy}@seas.upenn.edu`

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1 Overview

This project is an Android application that is used as a tool for students to interactively learn about algorithms in computer science. Specifically, this tool allows users to solve bin-packing and max-flow problems in the form of a game.

In this iteration, we have added increased functionality to the basic operation of the bin-packing problem application introduced in the first iteration. Namely, we have implemented an algorithm that calculates the optimal solution to the specified problems, removed the limit on the number of objects available for each configuration of the problem, and allowed the removal of one object at a time from bins. The complete list of user stories we have completed can be found in the Features section below.

2 Features

2.1 User stories

Below is a list of the user stories we have completed as of the end of this iteration, as well as the point values we have assigned to each.

1. As a user, I would like a metric of how optimal my solution is compared to the algorithm solution (1 point).
2. As a user, I should see my high score (1 point).
3. As a user, I would prefer larger size of bins and bin objects for devices (e.g. tablets) whose screen size is larger (2 points).
4. As a user who selected a difficulty level, I should see a paginated panel that displays all corresponding objects (3 points).
5. As a user, I should be able to remove objects from bins one at a time using the paginator (2 points).
6. As a user, I should be able to move objects from bin to bin (1 point).
7. As a user, I should be confronted with tricky problems on harder difficulties, wherein greedy algorithms won't work (1 point).

Total points completed: 10

There are no user stories that we planned to complete before this iteration demo that we have not completed.

2.2 Project Velocity

With four people working on this project for several weeks, and having completed a total of 11 points, our project velocity is calculated to be 2.75, which is slightly below the target velocity we hoped to work at. The reason for this is the development of test cases which carried no point value as they do not have corresponding user stories.

3 Testing, bugs, issues, etc.

Some JUnit test cases have been developed for the application, but they are not yet comprehensive. A full test suite will be available by the end of the next iteration.

There is also currently a bug in running the application on devices with a smaller screen sizes (e.g., a typical Android smartphone). The height of the view in which the objects and bins are displayed are currently hard-coded into the application, causing some parts of the app not to be displayed when it is run on a smaller device. This will be resolved in the next iteration.

Another minor bug in the application involves the display of text on the bins. When objects are removed from the bin, and the amount inside is reset, the text will occasionally display a very small number in scientific notation rather than simply zero. This should easily be resolved by rounding the displayed numbers properly.