Water Flow Simulation Project

Overview

This project simulates the flow of water over a terrain in a graphical environment using Java, with capabilities for user-interaction.

Features

- Terrain Generation: Converts terrain data to greyscale image.
- Water Simulation: Interactive simulation of water flow over the terrain.
- Mouse Interaction: Add water to the terrain using mouse clicks.
- Multithreading: Efficient water flow calculations using multithreading.

Classes

- Terrain: Acts as the Model part of the design, managing important terrain data and making important calculations that dictate the flow of water.
- Water: Handles the data and logic for water storage over the terrain, with methods for updating the data.
- Flow: Responsible for handling the GUI, and starting and joining threads.
- WaterClickListener: Processes mouse click events for adding water to the terrain interactively.
- FlowPanel: Responsible for painting the terrain.
- Control: Controls the running of the threads over the permuted lists.

Prerequisites

- Java Development Kit (JDK) 8 or later.

Setup and Running the Application

1. Clone the repository or download the project to your local machine.
2. Open the project in your terminal.
3. To compile the code, type "make", making sure you are in the root directory of the project.
4. To run the application, make sure you are still in the root directory of the project, then type "make run" to run the application with the default terrain data. If you want to run the application with your own data, type "make run myvar=file_path".

Usage

- On application launch, the terrain will be displayed in a window.
- Use the mouse to click on the terrain to add water at that location.
- Click “play” to watch the simulation of water flowing over the terrain. You can also stop, start, and reset the water flow at your leisure.

Contributions

Contributions are welcome. Please adhere to the project's coding standards and submit pull requests for any proposed changes.

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