CSE464-GraphProject-2

Overview

This project implements a directed graph in Java with various functionalities such as adding/removing nodes and edges, parsing DOT files, outputting DOT and PNG representations, and conducting graph searches using BFS and DFS. Continuous Integration (CI) has been set up using GitHub Actions to ensure that code changes are automatically tested.

Features

- 1. Add and Remove Nodes/Edges: APIs for adding/removing single or multiple nodes and edges.
- 2. Graph Search (BFS/DFS): Find paths between nodes using BFS or DFS.
- 3. Parse and Export DOT Format: Import graphs from DOT files and export them to DOT or PNG formats.
- 4. Continuous Integration (CI): Automatically runs tests upon code changes in GitHub.

Setup and Installation

- 1. Clone the Repository: git clone <your-github-repository-url> cd CSE464-GraphProject
- 2. Compile the Code: mvn package
- 3. Run Tests: mvn test

Usage Examples

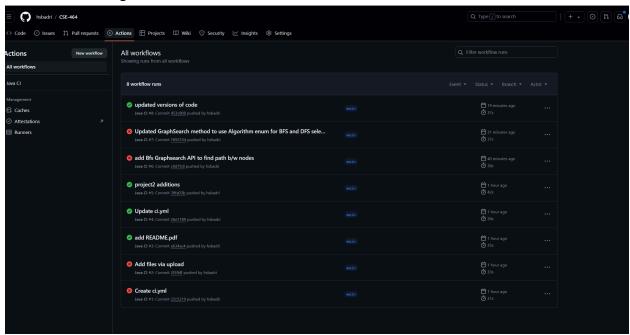
1. Adding and Removing Nodes and Edges

java

```
Graph graph = new Graph();
graph.addNode("A");
graph.addNode("B");
graph.addEdge("A", "B");
System.out.println(graph.toString()); // Outputs: A -> B
graph.removeNode("A");
2. Graph Search (BFS and DFS)
java
Path pathBFS = graph.GraphSearch("A", "C", Graph.Algorithm.BFS);
System.out.println(pathBFS);
Path pathDFS = graph.GraphSearch("A", "C", Graph.Algorithm.DFS);
System.out.println(pathDFS);
3. Exporting Graph to DOT and PNG
java
graph.outputDOTGraph("outputGraph.dot");
graph.outputGraphics("outputGraph", "png");
```

Continuous Integration

CI is enabled through GitHub Actions. The CI pipeline automatically compiles, tests, and verifies code changes.



```
[INFO]
          TESTS
[INFO] -------[INFO] -------[INFO] Running GraphTest
[INFO] Tests run: 13, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.136 s -- in GraphTest
[INFO] Tests run: 13, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.136 s -- in GraphTest
LINFO]
[INFO] Results:
[INFO]
[INFO] Tests run: 13, Failures: 0, Errors: 0, Skipped: 0
[INFO]
[INFO]
[INFO] --- jar:3.4.1:jar (default-jar) @ CSE464-GraphProject ---
[INFO] Building jar: C:\Users\Haindavi badri\Downloads\Project 1\Project 1\target\CSE464-GraphProject-1.0-SNAPSHOT.jar
 [INFO]
[INFO] Total time: 5.460 s
[INFO] Finished at: 2024-11-07T14:02:55-07:00
[INFO]
C:\Users\Haindavi badri\Downloads\Project 1\Project 1>java -cp target/classes GraphDemo Example 1: Adding and Removing Nodes and Edges
Graph after adding A -> B:
Nodes: [A, B]
 Edges:
A -> B
Graph after removing node A:
Nodes: [B]
 Edges:
Example 2: Graph Search (BFS and DFS)
BFS path from A to C: A -> B -> C
DFS path from A to C: A -> B -> C
Example 3: Exporting Graph to DOT and PNG
 Graph exported as outputGraph.dot and outputGraph.png.
```

