

## Graph Parser Project Phase 2 – README

### Project Overview

This project implements a graph parser program that processes a DOT file and generates a visual depiction in addition to other features such as modifying node, modifying edges, performing BFS and DFS on the graph. The project also includes a JUnit test feature to ensure the program passes the expected test cases.

### GitHub Link

<https://github.com/anishnallani22/CSE-464-2024-anallani>

### Instructions to Run the Project

1. Clone the Repository

git clone <https://github.com/anishnallani22/CSE-464-2024-anallani.git>

2. Navigate into project directory

cd CSE-464-2024-anallani

3. Build the Project with Maven

mvn package

4. Run the Program

java -jar target/CSE464-GraphManager-1.0-SNAPSHOT.jar src/main/resources/input.dot

5. Run Unit Tests

mvn test

### Example Input and Output

1. Example Input (Input.dot File)

```
digraph {  
  a -> b;  
  b -> c;  
  c -> d;  
  d -> a;  
  a -> e;  
  e -> g;  
  h -> d;  
  f -> h;  
  g -> h;  
}
```

2. Remove a node API

=== Testing Feature 5: Removing a Single Node ===

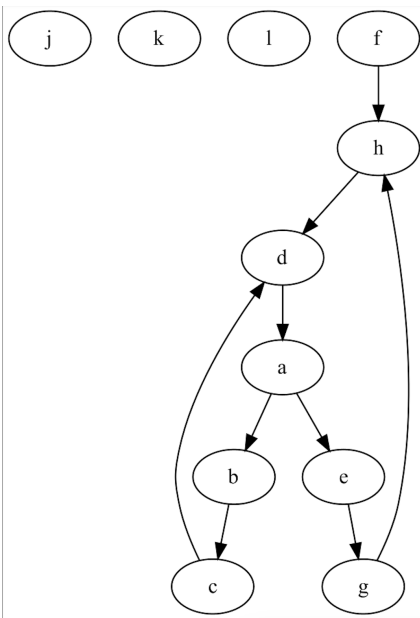
Node 'i' added successfully.

Node 'j' added successfully.

Node 'k' added successfully.

Node 'l' added successfully.

Node 'i' removed



### 3. Remove multiple nodes API

=== Testing Feature 6: Removing Multiple Nodes ===

Node 'i' added successfully.

Node 'j' added successfully.

Node 'k' added successfully.

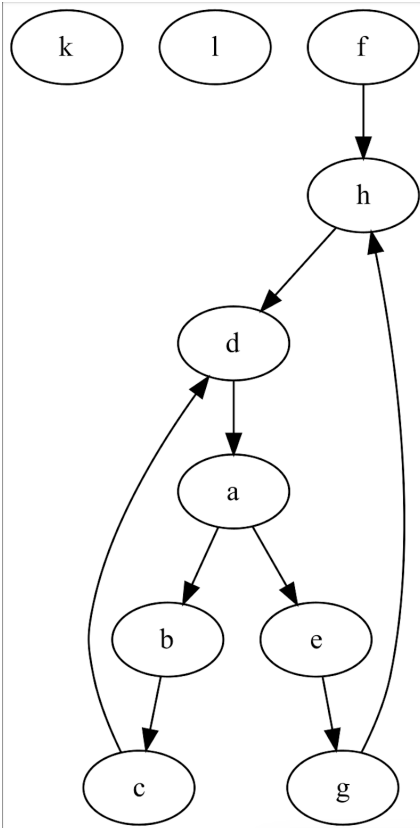
Node 'l' added successfully.

Edge added from 'a' to 'i'.

Edge added from 'b' to 'j'.

Node 'i' removed successfully.

Node 'j' removed successfully.



#### 4. Remove an edge API

=== Testing Feature 7: Removing an Edge ===

Node 'i' added successfully.

Node 'j' added successfully.

Node 'k' added successfully.

Node 'l' added successfully.

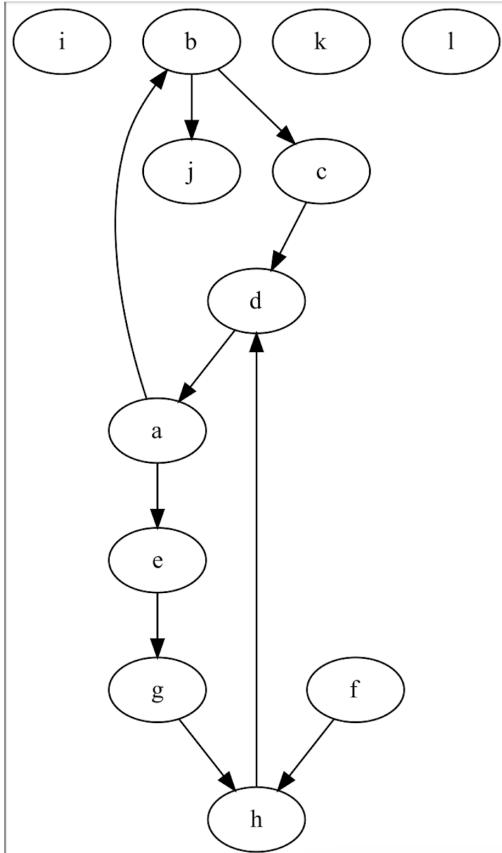
Edge added from 'a' to 'i'.

Edge added from 'b' to 'j'.

Edge added from 'c' to 'k'.

Edge from 'a' to 'i' removed successfully.

Edge from 'b' to 'j' removed successfully.



#### 5. BFS and DFS

Graph image generated at: src/main/resources/output1.png

Original graph image generated at: src/main/resources/output1.png

Node 'i' added successfully.

Node 'j' added successfully.

Node 'k' added successfully.

Node 'l' added successfully.

Nodes added:

Graph Details after adding nodes:

Number of nodes: 12

Nodes: [f, h, a, b, e, d, c, g, i, j, k, l]

Number of edges: 9

Edges:

f -> h

a -> b  
a -> e  
h -> d  
b -> c  
c -> d  
e -> g  
d -> a  
g -> h

Graph image generated at: src/main/resources/output2.png

Updated graph image generated at: src/main/resources/output2.png

Edge added from 'a' to 'i'.

Edge added from 'b' to 'j'.

Edge added from 'c' to 'k'.

Edge added from 'd' to 'l'.

Edges added:

Graph Details after adding edges:

Number of nodes: 12

Nodes: [f, h, a, b, e, d, c, g, i, j, k, l]

Number of edges: 13

Edges:

f -> h  
a -> b  
a -> e  
h -> d  
b -> c  
c -> d  
e -> g  
d -> a  
g -> h  
a -> i  
b -> j  
c -> k  
d -> l

=== Performing BFS Search ===

Path found using BFS: a -> b -> c -> d -> l

=== Performing DFS Search ===

Path found using DFS: a -> e -> g -> h -> d -> l

Graph successfully written to DOT file: src/main/resources/outputGraph.dot

Graph successfully written as PNG image: src/main/resources/output4.png

Final graph image generated at: src/main/resources/output4.png

DOT file generated at: src/main/resources/outputGraph.dot

## GitHub Commits and Branches

1. Added removeNode.java class(individual nodes) and added respective test cases:

<https://github.com/anishnallani22/CSE-464-2024-anallani/commit/34e6c4b7ba0667284a0963d60e55aa5a48aaba95>

2. Implemented removeMultipleNodes feature and restructured JUnit testing features and modified Main.java to ensure functionality:

<https://github.com/anishnallani22/CSE-464-2024-anallani/commit/d9cebc6df06abe6c2b84ddde711bba72fc51d271>

3. Implemented removeEdge feature and updated Main.java and JUnit test cases:

<https://github.com/anishnallani22/CSE-464-2024-anallani/commit/83babcc21872c9277e125d8b9c9b0427a0e32787>

4. Modified corresponding JUnit test cases:

<https://github.com/anishnallani22/CSE-464-2024-anallani/commit/773ad64d99cff16984bbdcfbacbcf6b59a267ac2>

5. Added GitHub Continuous Integration and updated JUnit test cases:

<https://github.com/anishnallani22/CSE-464-2024-anallani/commit/9fed974f8612cddc306acd6272f662a9b9ee008e>

6. Moved CI workflow file to correct directory:

<https://github.com/anishnallani22/CSE-464-2024-anallani/commit/a80f8d4afa66a381e8b2ab273381580df23302fb>

7. Moved CI workflow to the correct directory:

<https://github.com/anishnallani22/CSE-464-2024-anallani/commit/8d03de848ba6439256aa78fe911a31f0fae00705>

8. Removed old projectflow folder:

<https://github.com/anishnallani22/CSE-464-2024-anallani/commit/ea0d32b7c440a6dbca8d4a746037736ed2e082a8>

9. Removed old workflows:

<https://github.com/anishnallani22/CSE-464-2024-anallani/commit/0ca40f2af2f9a6a3bc9aba7001b052a376c21051>

10. Added new workflow:

<https://github.com/anishnallani22/CSE-464-2024-anallani/commit/398d45fd5744054d41004f9eb0cfc967169b5106>

11. bfs save 1:

<https://github.com/anishnallani22/CSE-464-2024-anallani/commit/f727c7a2994206adf354314f9871f1b4d3b2cea4>

12. Implemented BFS graph search functionality:

<https://github.com/anishnallani22/CSE-464-2024-anallani/commit/e685638fc431da20803cab5805e36fd3bc896bca>

13. Implemented DFS graph search functionality:

<https://github.com/anishnallani22/CSE-464-2024-anallani/commit/6e8e38bbc16bf26bbfa51644039e4c827caaaeca>

14. Updated BFS branch to include adding nodes and edges:

<https://github.com/anishnallani22/CSE-464-2024-anallani/commit/88fb12f3f3a7bb51d5e9b62f82d3d2a58b1b1e66>

15. Merged BFS and DFS using Algorithm.java to resolve conflict:

<https://github.com/anishnallani22/CSE-464-2024-anallani/commit/0480dc5ccabff636205813d819eda9974d486dcb>

16. Updated Main.java to include BFS and DFS path search functionality and to include addNodes and addEdges:

<https://github.com/anishnallani22/CSE-464-2024-anallani/commit/7cd9a7505f9640e7762a9275428866fda281c2e6>

17. Updated tests for PNG output and added generated PNG files for features 5, 6, and 7

<https://github.com/anishnallani22/CSE-464-2024-anallani/commit/2ad379e7771a56fd3d263e0a037456e54a22ece9>