

## GraphDot Project - CSE 464

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Repo: <https://github.com/btflahar/CSE-464-btflahar-graph.git>

mvn package command works and will properly build

There should be a total of 14 Tests that run when package is run

I used the Maven Sideboard and did Lifecycle -> Package but mvn package is the same so it should work. Fixed expected.txt issue so mvn package does work.

Java 17

Apache Maven

GraphViz

Is required

mvn clean package to start

Place DOT file in the root (input.dot)

Run the following command:

**java -cp target/classes btflahar.asu.edu.graphDot.GraphApp input.dot output.png**

It should produce graph-report.txt, input.dot and output.png (the graphViz image)

The example input.dot given is very simple

```
Digraph G {  
    A-> B;  
    B->C;  
    D;  
}
```

The expected graph-report is

Nodes: 4

Edges: 2

A->B

B->C

All of the test files are located at

**src/test/java/btflahar/asu/edu/graphDot/GraphAppTest.java**

All tests can be run with mvn test or by simply navigating to each class in GraphAppTest.java and pressing the play button to the left of the class.

All test classes have areas to insert desired input and check for the expected correct output. Below are the images for each Feature implemented.



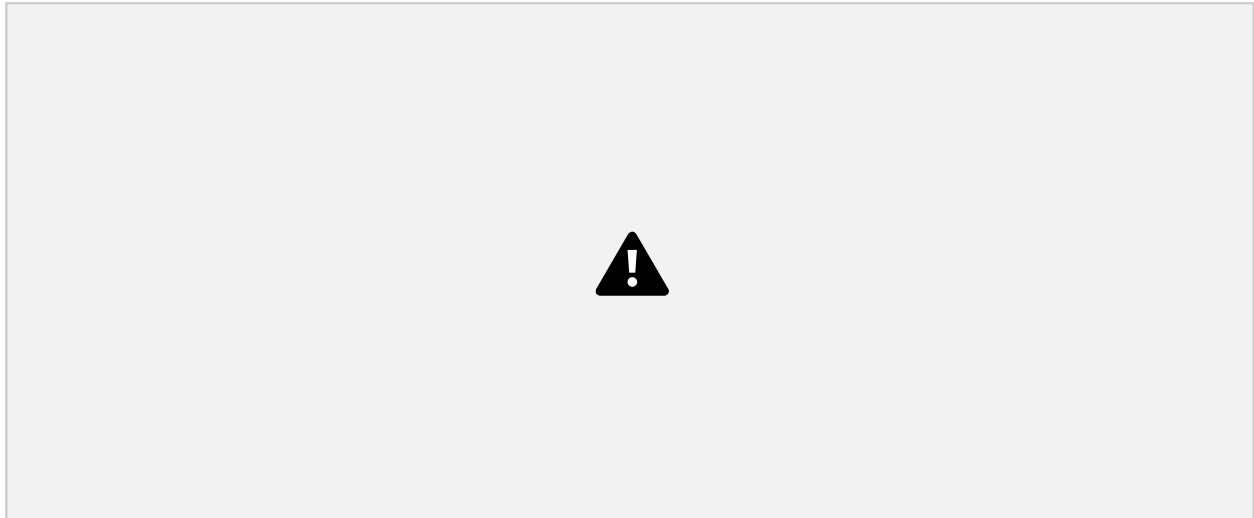


The first 3 images show the classes with example nodes being added, and then test statements doing actions to test the class. In Feature 1 we have A, B, C, and D Nodes added, then have A removed as well as the B->C Edge. So we compare it to the expected result, that being 3 nodes remaining, and 1 edge remaining as well as ensuring the edges remaining match what is correct.

Features 2 and 3 follow this scheme as well, the correct output is listed at the bottom of each class and is compared to the output that is produced by the class when it is ran to ensure it is correct. If an error occurs in the test case, it will fail.

We have the Continuous Integration running and active on the github with images to show below





7 workflow runs		Event ▾	Status ▾	Branch ▾	Actor ▾
✔	Feat: Task 4 added graphSearch for DFS and all test cases		dfs	2 minutes ago	...
Github CI Task 2 #7: Commit <a href="#">4e651c6</a> pushed by <a href="#">btflahar</a>			17s		
✔	Feat: Added Task 3 graphSearch and graphSearchTests		bfs	29 minutes ago	...
Github CI Task 2 #6: Commit <a href="#">a968feb</a> pushed by <a href="#">btflahar</a>			15s		
✔	Fix 2		main	Today at 7:20 PM	...
Github CI Task 2 #5: Commit <a href="#">fa9be5b</a> pushed by <a href="#">btflahar</a>			29s		
✖	Fix to version 17		main	Today at 7:11 PM	...
Github CI Task 2 #4: Commit <a href="#">f0f68e8</a> pushed by <a href="#">btflahar</a>			20s		
✔	Fix		main	Today at 6:50 PM	...
Github CI Task 2 #3: Commit <a href="#">b81f696</a> pushed by <a href="#">btflahar</a>			36s		
✖	Fixed yaml		main	Today at 6:36 PM	...
Github CI Task 2 #2: Commit <a href="#">19bccf7</a> pushed by <a href="#">btflahar</a>			24s		
✖	Feat: Project 2 Task 2: Github CI workflow integration		main	Today at 6:34 PM	...
Github CI Task 2 #1: Commit <a href="#">5259bbd</a> pushed by <a href="#">btflahar</a>			Failure		

All of the images above show CI being integrated and used properly.

From here the BFS and DFS occurred. Here are the images of each being implemented, and tested as well as finally merged, creating a conflict and resolving it



```
15 class GraphAppTest {
16     void graphSearchOfsExist() {
17         btflahar.asu.edu.graphDot.Path path = app.graphSearch(srcLabel: "W", dstLabel: "Z");
18
19         assertNotNull(path, message: "Path W->Z is valid");
20         assertEquals(List.of("W", "X", "Y", "Z"), path.getNodes());
21         assertEquals(expected: "W -> X -> Y -> Z", path.toString());
22     }
23
24     @Test new *
25     void graphSearchOfsNullPath() {
26         GraphApp app = new GraphApp();
27
28         app.addNodes(new String[]{"W", "X", "Y", "Z"});
29         app.addEdge(srcLabel: "W", dstLabel: "X"); // No edges for Z
30
31         btflahar.asu.edu.graphDot.Path path = app.graphSearch(srcLabel: "W", dstLabel: "Z");
32
33         assertNull(path, message: "Path W->Z should be null");
34     }
35 }
```

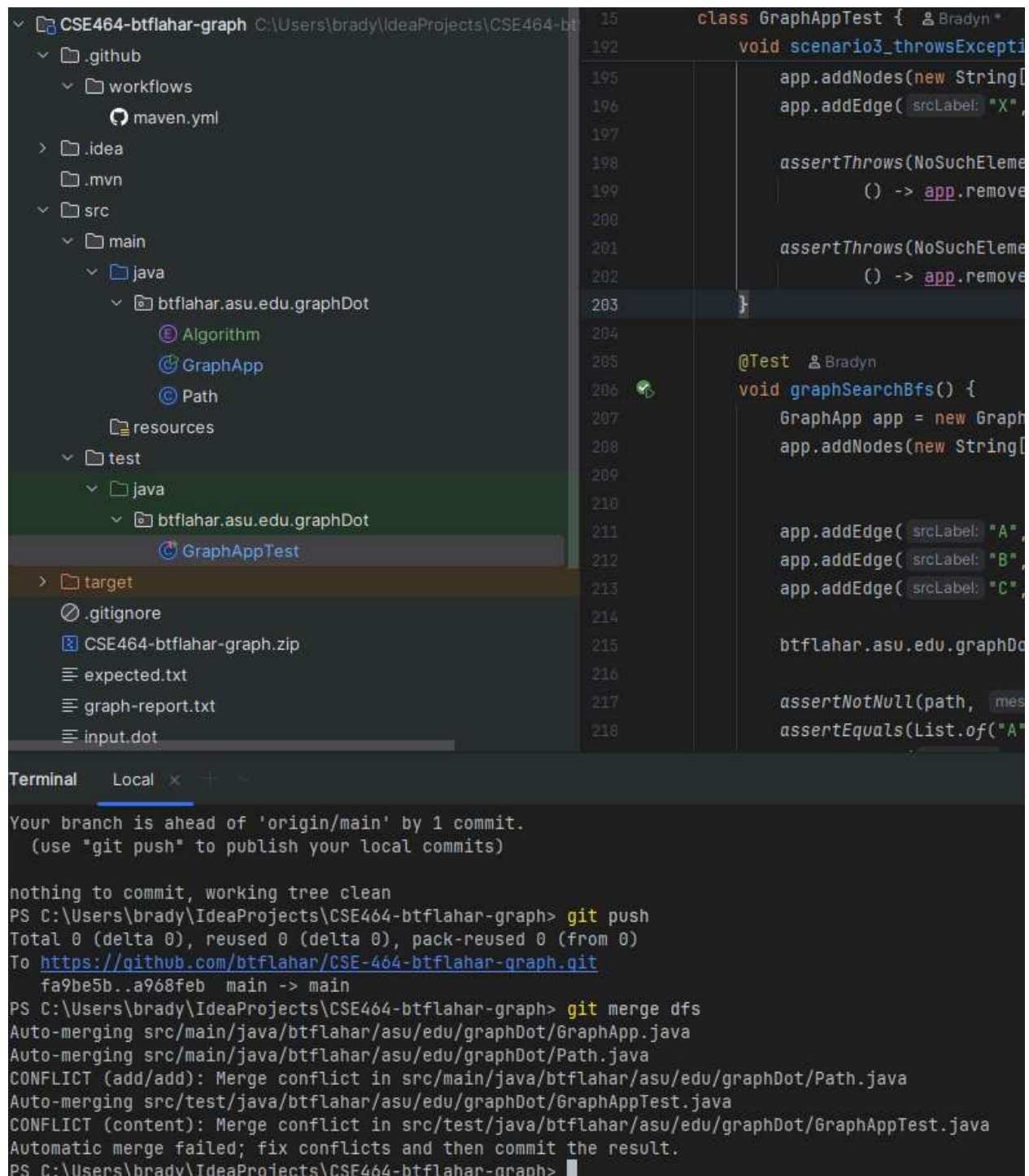
✓ 1 test passed 1 test total, 49ms

C:\Users\brady\.jdk\openjdk-25\bin\java.exe ...

Process finished with exit code 0







The screenshot shows an IDE with a project named 'CSE464-btflahar-graph'. The project structure on the left includes a 'test' directory with a 'java' subdirectory containing 'btflahar.asu.edu.graphDot' and 'GraphAppTest'. The main code editor displays the 'GraphAppTest' class with a 'scenario3\_throwsException' method and a 'graphSearchBfs' test method. The terminal at the bottom shows the output of 'git push' and 'git merge dfs', indicating a successful push and a merge conflict in 'Path.java' and 'GraphAppTest.java'.

```
class GraphAppTest {
    void scenario3_throwsException() {
        app.addNodes(new String[] { "A", "B", "C" });
        app.addEdge( srcLabel: "X", ... );
        assertThrows(NoSuchElementException.class, () -> app.removeNode("X"));
        assertThrows(NoSuchElementException.class, () -> app.removeEdge("X"));
    }

    @Test
    void graphSearchBfs() {
        GraphApp app = new GraphApp();
        app.addNodes(new String[] { "A", "B", "C" });
        app.addEdge( srcLabel: "A", destLabel: "B", weight: 1 );
        app.addEdge( srcLabel: "B", destLabel: "C", weight: 1 );
        app.addEdge( srcLabel: "C", destLabel: "A", weight: 1 );
        btflahar.asu.edu.graphDot graphDot = new btflahar.asu.edu.graphDot( app );
        assertNotNull( path, message = "Path is null" );
        assertEquals( List.of( "A", "B", "C" ), path );
    }
}
```

```
PS C:\Users\brady\IdeaProjects\CSE464-btflahar-graph> git push
Total 0 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/btflahar/CSE-464-btflahar-graph.git
fa9be5b..a968feb main -> main
PS C:\Users\brady\IdeaProjects\CSE464-btflahar-graph> git merge dfs
Auto-merging src/main/java/btflahar/asu/edu/graphDot/GraphApp.java
Auto-merging src/main/java/btflahar/asu/edu/graphDot/Path.java
CONFLICT (add/add): Merge conflict in src/main/java/btflahar/asu/edu/graphDot/Path.java
Auto-merging src/test/java/btflahar/asu/edu/graphDot/GraphAppTest.java
CONFLICT (content): Merge conflict in src/test/java/btflahar/asu/edu/graphDot/GraphAppTest.java
Automatic merge failed; fix conflicts and then commit the result.
PS C:\Users\brady\IdeaProjects\CSE464-btflahar-graph>
```

Images 1 and 2 are BFS features, 3 and 4 are DFS features,  
Image 5 is the merge conflict occurring

Here are the links for all commits in the project

<https://github.com/btflahar/CSE-464-btflahar-graph/commit/8e9bef07a5c54683194413e4678a62832f50b165>

<https://github.com/btflahar/CSE-464-btflahar-graph/commit/79a4faa12024c432f2954a3d48c2723086fff307>

<https://github.com/btflahar/CSE-464-btflahar-graph/commit/79a4faa12024c432f2954a3d48c2723086fff307>

<https://github.com/btflahar/CSE-464-btflahar-graph/commit/5259bbd32106dc350a682ca52ca37aa3649cf68d>

<https://github.com/btflahar/CSE-464-btflahar-graph/commit/19bccf7bca38f41e84fa11c2cac14a68a9c8bf2a>

<https://github.com/btflahar/CSE-464-btflahar-graph/commit/b81f6967006cae499b813aa4705e413a11c13a21>

<https://github.com/btflahar/CSE-464-btflahar-graph/commit/f0f68e8def9574a38efc4f199a3201a2dd31a62e>

<https://github.com/btflahar/CSE-464-btflahar-graph/commit/fa9be5bd20b2844b84b423aaf19c69d9e38cca96>

<https://github.com/btflahar/CSE-464-btflahar-graph/commit/a968febd44399dfd2101c94e66e9534aa3627cff>

<https://github.com/btflahar/CSE-464-btflahar-graph/commit/4e651c686d59535b5dbac3421d021f98a625c2ea>

<https://github.com/btflahar/CSE-464-btflahar-graph/commit/00984cb91ee701fccc31b0584d6bea85e091e025>