

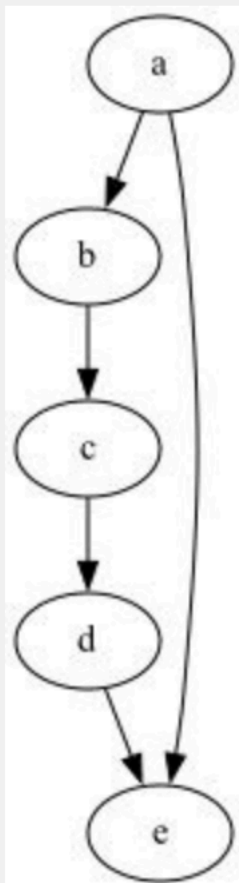
## ReadMe

**GithubLink:** <https://github.com/DhavalPatodiya/CSE-464-2023-dpatodiy>

### Explanation of BFS and DFS:

- Both the algorithm will not detect path if the node is not present and will return null as output.
- Both algorithm will not detect path if there is no path from Node A to Node B.
- Both algorithm will return path in form of object of "Path Class" and can be converted to string using pathobject.toString() ("a->b->c")
- Both algorithm will take 'src', 'dst' as String and 'algo' as Algorithm enum.
- If the pathSearch API is provided with invalid names of Algorithm then it will throw error.
- The graph will not find path form Node A to Node A unless and until there is a cycle from Node A to Node A. If there is no incoming edges in Node A then the path will not be found and will be returned as null.

### Input Graph:



### Branch And commits:

## 1) Branch dfs and bfs

DhavalPatodiya / CSE-464-2023-dpatodiya

Private

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Code

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Pull requests 1

Actions

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Search branches...

Overview

Yours

Active

Stale

All branches

New branch

Default branch

main

Updated 19 minutes ago by DhavalPatodiya

✓

Default

Your main branch isn't protected

Protect this branch from force pushing or deletion, or require status checks before merging. [Learn more](#)

Dismiss

Protect this branch

Your branches

dfs

Updated 23 minutes ago by DhavalPatodiya

✓

3 | 1

#2

Open

bfs

Updated 5 days ago by DhavalPatodiya

✓

1 | 0

#1

Merged

Active branches

dfs

Updated 23 minutes ago by DhavalPatodiya

✓

3 | 1

#2

Open

bfs

Updated 5 days ago by DhavalPatodiya

✓

1 | 0

#1

Merged

2) Merge conflict of branch dfs in main after merging main

- DFS commit for merge conflict: <https://github.com/DhavalPatodiya/CSE-464-2023-dpatodiy/commit/d9236e237d869801807f3d0f04bb010ce64f5103>

Open

DhavalPatodiya wants to merge 2 commits into [main](#) from [dfs](#)

Conversation 0

Commits 2

Checks 1

Files changed 3

+77 -0

DhavalPatodiya commented 29 minutes ago

...

No description provided.

DhavalPatodiya added 2 commits 32 minutes ago

DFS

dfs algo

383fe14

d9236e2

Add more commits by pushing to the [dfs](#) branch on [DhavalPatodiya/CSE-464-2023-dpatodiya](#).

All checks have passed

1 successful check

Show all checks

This branch has conflicts that must be resolved

Use the [web editor](#) or the [command line](#) to resolve conflicts.

Resolve conflicts

Conflicting files

src/main/java/GraphManager.java

src/main/java/Path.java

test/GraphManagerTest.java

Merge pull request

You can also [open this in GitHub Desktop](#) or view [command line instructions](#).

Reviews

No reviews

Still in progress? Learn about draft PRs

Assignees

No one—assign yourself

Labels

None yet

Projects

None yet

Milestone

No milestone

Development

Successfully merging this pull request may close these issues.

None yet

Notifications

Unsubscribe

You're receiving notifications because you're watching this repository.

### 3) Merging BFS to Main before merging DFS.

- BFS commit of merge: <https://github.com/DhavalPatodiya/CSE-464-2023-dpatodiy/commit/33fed0162f675180bda398279f99597e392bc4fe>

**Bfs #1** Edit <> Code

**Merged** DhavalPatodiya merged 2 commits into `main` from `bfs` 18 minutes ago

Conversation 0 Commits 2 Checks 1 Files changed 5 +103 -11

DhavalPatodiya commented 18 minutes ago

- Merging bfs to main

DhavalPatodiya added 2 commits 5 days ago

- BFS ✓ d798164
- Changing return type of API ✓ 33fed01

DhavalPatodiya merged commit 6851f1c into `main` 18 minutes ago  
1 check passed View details Revert

**Pull request successfully merged and closed**  
You're all set—the `bfs` branch can be safely deleted. Delete branch

Write Preview H B I

Leave a comment

Reviewers: No reviews

Assignees: No one—assign yourself

Labels: None yet

Projects: None yet

Milestone: No milestone

Development: Successfully merging this pull request may close these issues.

Notifications: Customize

### 4) Github CI setup properly and successful runs:

- Commit id of first successful run : <https://github.com/DhavalPatodiya/CSE-464-2023-dpatodiy/commit/724819bdf576dc7b620c351d493587eaf0740e4f>
- First failed run : <https://github.com/DhavalPatodiya/CSE-464-2023-dpatodiy/commit/d5714c3085fd200d805670916ce16c686817df48>

Conversation 0 Commits 3 Checks 1 Files changed 5 +71 -24

DhavalPatodiya commented 1 hour ago

No description provided.

DhavalPatodiya added 3 commits 1 hour ago

- DFS ✓ 383fe14
- dfs algo ✓ d9236e2
- resolving conflicts ✓ de7f876

Add more commits by pushing to the `dfs` branch on DhavalPatodiya/CSE-464-2023-dpatodiy.

**Require approval from specific reviewers before merging**  
Branch protection rules ensure specific people approve pull requests before they're merged. Add rule ×

**✓ All checks have passed**  
1 successful check Show all checks

**✓ This branch has no conflicts with the base branch**  
Merging can be performed automatically.

**Merge pull request** × You can also [open this in GitHub Desktop](#) or view [command line instructions](#).

Reviewers: No reviews  
Still in progress? [Learn about draft PRs](#)

Assignees: No one—assign yourself

Labels: None yet

Projects: None yet

Milestone: No milestone

Development: Successfully merging this pull request may close these issues.

Notifications: Unsubscribe  
You're receiving notifications because you're watching this repository.

## 5) Resolved Conflicts

- Commit id: <https://github.com/DhavalPatodiya/CSE-464-2023-dpatodiy/pull/2/commits/de7f8761a6fe6e84d39e3eee3c944a44b3affac1>
- Successful merge id: <https://github.com/DhavalPatodiya/CSE-464-2023-dpatodiy/pull/2>

The screenshot shows the GitHub Actions interface for a workflow named 'build'. The workflow is part of the repository 'DhavalPatodiya / CSE-464-2023-dpatodiy' and is triggered by a pull request. The workflow status is 'succeeded 20 minutes ago in 22s'. The 'build' job is highlighted in the left sidebar. The job steps are listed in a table:

Step	Duration
Set up job	1s
Run actions/checkout@v3	1s
Set up JDK 20	7s
Build with Maven	12s
Post Set up JDK 20	0s
Post Run actions/checkout@v3	0s
Complete job	0s

## Instructions and example code

I have written test cases providing the expected value and actual values explaining with comments. I am attaching the screenshot of test cases here providing detailed explanations:

### 1) BFS algo with path found:

```
// a-d path exists
@Test
public void bfsPathFound() throws Exception{
    String expected = "a->b->c->d";
    Path actual = g.graphSearch(src: "a", dst: "d", Algorithm.BFS);
    Assert.assertTrue(expected.equals(actual.toString()));
}
```

### 2) BFS algo with path not found from node itself to node itself: As once we leave the node we can't reach it meaning there is no cycle from a to a.

```
//from a to a there is no path like a->b->a, there is no path to return to a once you leave a
@Test
public void bfsPathNotFound() throws Exception{
    Path actual = g.graphSearch(src: "a", dst: "a", Algorithm.BFS);
    Assert.assertNull(actual);
}
```

- 3) BFS algo When path doesn't exists as node f doesn't exists

```
// a-f path doesn't exists as f doesn't exists.
@Test
public void bfsPathNotFoundNode() throws Exception{
    Path actual = g.graphSearch( src: "a", dst: "f", Algorithm.BFS);
    Assert.assertNull(actual);
}
```

- 4) DFS algo with path exists between src and dst.

```
//b-e path exists
@Test
public void dfs() throws Exception{
    String expected = "b->c->d->e";
    Path actual = g.graphSearch( src: "b", dst: "e", Algorithm.DFS);
    Assert.assertEquals(expected, actual.toString());
}
```

- 5) DFS algo with path not found from node itself to node itself: As once we leave the node we can't reach it meaning there is no cycle from a to a.

```
//from a to a there is no path like a->b->a, there is no path to return to a once you leave a
@Test
public void dfsPathNotFound() throws Exception{
    Path actual = g.graphSearch( src: "a", dst: "a", Algorithm.DFS);
    Assert.assertNull(actual);
}
```

- 6) DFS algo with node doesn't exists will return null. a-g path is not present as there is no node g.

```
// a-g path doesn't exists as g doesn't exists.
@Test
public void dfsPathNodeNotFound() throws Exception{
    Path actual = g.graphSearch( src: "a", dst: "g", Algorithm.DFS);
    Assert.assertNull(actual);
}
```

- 7) IllegalArgumentException thrown when algo is other than DFS or BFS.

```
//IllegalArgumentException thrown when algo is other than BFS or DFS
@Test(expected= IllegalArgumentException.class)
public void invalidEnumName() throws Exception{
    System.out.println(g.graphSearch( src: "b", dst: "e", Algorithm.valueOf("DMS")));
}
```

8) NullPointerException thrown when algo is null.

```
//NullPointerException thrown when algo is null
@Test(expected= NullPointerException.class)
public void algoNameIsNull() throws Exception{
    System.out.println(g.graphSearch( src: "b", dst: "e", algo: null));
}
```

## Git Commit TimeLine

Commit Message	Branch	Author	Time
Update README.md	origin & main	Dhaval Patodiya*	Moments ago
<b>Adding Readme For Project Part-2</b>		DhavalPatodiya	2 minutes ago
Merge pull request #2 from DhavalPatodiya/dfs		Dhaval Patodiya*	21 minutes ago
<b>Adding comments</b>	origin & dfs	DhavalPatodiya	21 minutes ago
<b>Bug Fix</b>		DhavalPatodiya	Today 18:41
resolving conflicts		DhavalPatodiya	Today 17:35
dfs algo		DhavalPatodiya	Today 17:04
Merge pull request #1 from DhavalPatodiya/bfs		Dhaval Patodiya*	Today 16:35
<b>DFS</b>		DhavalPatodiya	Today 16:32
Changing return type of API	origin & bfs	DhavalPatodiya	24/03/23, 00:57
BFS		DhavalPatodiya	24/03/23, 00:48
testing changes		DhavalPatodiya	23/03/23, 23:46
testing changes		DhavalPatodiya	23/03/23, 23:42
testing changes		DhavalPatodiya	23/03/23, 23:34
testing changes		DhavalPatodiya	23/03/23, 23:31
getting file structure		DhavalPatodiya	23/03/23, 23:26
getting file structure		DhavalPatodiya	23/03/23, 23:21
getting file structure		DhavalPatodiya	23/03/23, 19:02
getting file structure		DhavalPatodiya	23/03/23, 18:59
getting file structure		DhavalPatodiya	23/03/23, 18:58
changing file structure		DhavalPatodiya	23/03/23, 18:55
changing file structure		DhavalPatodiya	23/03/23, 18:52