

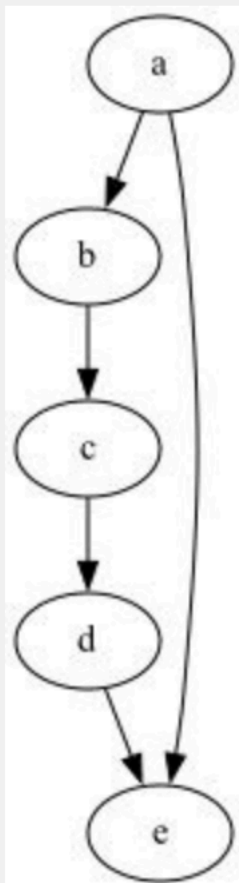
## ReadMe

**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

The screenshot shows the GitHub interface for the repository `DhavalPatodiya / CSE-464-2023-dpatodiy`. The top navigation bar includes links for Code, Issues, Pull requests (1), Actions, Projects, Wiki, Security, Insights, and Settings. Below the navigation bar, there's a search bar for branches and tabs for Overview, Yours, Active, Stale, All branches, and a New branch button. The main content area is divided into three sections: Default branch, Your branches, and Active branches. The Default branch section shows the `main` branch, updated 19 minutes ago by Dhaval Patodiya, with a green checkmark indicating it's the default branch. Below this, a message states "Your main branch isn't protected" with a "Protect this branch" button. The Your branches section lists two branches: `dfs` (updated 23 minutes ago) and `bfs` (updated 5 days ago). Both branches have a green checkmark and a "3 | 1" status. The Active branches section also lists these two branches with the same status. The `dfs` branch has a "#2 Open" label, and the `bfs` branch has a "#1 Merged" label.

### 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>

The screenshot shows a GitHub pull request page for the repository `DhavalPatodiya / CSE-464-2023-dpatodiy`. The pull request is titled "DhavalPatodiya wants to merge 2 commits into `main` from `dfs`". The pull request is in the "Open" state. The main content area shows a conversation with two comments: "DhavalPatodiya commented 29 minutes ago" (No description provided) and "DhavalPatodiya added 2 commits 32 minutes ago". The commits are `DFS` (383fe14) and `dfs algo` (d9236e2). The pull request has a green checkmark indicating that all checks have passed. Below the conversation, there's a message stating "This branch has conflicts that must be resolved" with a "Resolve conflicts" button. The conflicting files are listed as `src/main/java/GraphManager.java`, `src/main/java/Path.java`, and `test/GraphManagerTest.java`. The right sidebar shows the pull request details, including 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), and Notifications (Unsubscribe).

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 33fed81 ✓

DhavalPatodiya merged commit 685f1c 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

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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.

None yet

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>
- Workflow link: <https://github.com/DhavalPatodiya/CSE-464-2023-dpatodiy/actions>

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

dfs algo

resolving conflicts

✓ 383fe14

✓ d9236e2

✓ 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.

None yet

Notifications

Customize

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

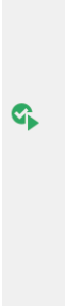


```

// 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>		<b>DhavalPatodiya</b>	<b>2 minutes ago</b>
Merge pull request #2 from DhavalPatodiya/dfs		Dhaval Patodiya*	21 minutes ago
<b>Adding comments</b>	origin & dfs	<b>DhavalPatodiya</b>	<b>21 minutes ago</b>
<b>Bug Fix</b>		<b>DhavalPatodiya</b>	<b>Today 18:41</b>
resolving conflicts		<b>DhavalPatodiya</b>	<b>Today 17:35</b>
dfs algo		<b>DhavalPatodiya</b>	<b>Today 17:04</b>
Merge pull request #1 from DhavalPatodiya/bfs		Dhaval Patodiya*	Today 16:35
<b>DFS</b>		<b>DhavalPatodiya</b>	<b>Today 16:32</b>
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