

# Graph Searches, Lab Assignment 14

Due Tuesday by 11:59pm

Points 100

Submitting a file upload

File Types cpp and h

## Part 1

Write **BFS.cpp**, by completing the supplied CPP file. Click [HERE \(https://4cd.instructure.com/courses/10266/files/7700/download?wrap=1\)](https://4cd.instructure.com/courses/10266/files/7700/download?wrap=1) to download the supplied file that contains the main function and a function outline for BFS. Right-click [HERE \(https://4cd.instructure.com/courses/10266/files/7678/download?wrap=1\)](https://4cd.instructure.com/courses/10266/files/7678/download?wrap=1) to download the input file to use, containing road map information for California. Click [HERE \(http://www.streetlookup.com/state/california-map.html\)](http://www.streetlookup.com/state/california-map.html) for a map of California. Write the missing code block in the missing BFS function, based on the algorithm in the lecture notes.

Submit the CPP to the class website for credit. Do NOT submit the TXT file.

**Program I/O.** Input: As prompted, a start city. Output: The BFS-based list of cities reachable from start. Here's what the result should be for the start city of San Francisco:

```
Enter the start city [blank to exit]: San Francisco
BFS-San Francisco-Eureka-Redding-Sacramento-Fresno-Bakersfield-San Luis Obispo-Coos Bay-Grants Pass-Klamath Falls-Lakeview-Reno-Bishop-Barstow-Los Angeles-Winnemucca-Ely-Las Vegas-San Diego-Needles-Blythe-Yuma

Enter the start city [blank to exit]: Yuma
BFS-Yuma-Los Angeles-Blythe-San Diego-Bishop-San Luis Obispo-Bakersfield-Barstow-Needles-Sacramento-Reno-Winnemucca-Ely-Las Vegas-San Francisco-Fresno-Redding-Eureka-Grants Pass-Klamath Falls-Lakeview-Coos Bay

Enter the start city [blank to exit]:
Done!
```

## Part 2

Write **DFS.cpp**, by modifying the Part 1 CPP. Replace the doBreadthFirstSearch BFS function with doDepthFirstSearch, doing DFS based on the algorithm in the module.

Remember to use *reverse iteration* where it's indicated in the DFS algorithm, and remember that `iterator::end` is *not* a valid node! There are several ways to do this, and `for (it = x.end(); it! = x.begin(i); it--)` is *not* one of them.

Submit the CPP to the class website for credit. Do NOT submit the TXT file.

**Program I/O.** Input: As prompted, a start city. Output: The DFS-based list of cities reachable from start. Here's what the result should be for the start city of San Francisco:

```
Enter the start city [blank to exit]: San Francisco
DFS-San Francisco-Eureka-Coos Bay-Grants Pass-Redding-Klamath Falls-Lakeview-Reno-Sacramento-Bishop-Winnemucca-Ely-Las Vegas-San Diego-Barstow-Bakersfield-Fresno-San Luis Obispo-Los Angeles-Blythe-Needles-Yuma

Enter the start city [blank to exit]: Yuma
DFS-Yuma-Los Angeles-Bishop-Sacramento-Redding-Eureka-Coos Bay-Grants Pass-San Francisco-Fresno-Bakersfield-Barstow-Needles-Blythe-San Diego-San Luis Obispo-Klamath Falls-Lakeview-Reno-Winnemucca-Ely-Las Vegas
```

Enter the start city [blank to exit]:

Done!

Lab Assignment Rubric										
Criteria	Ratings								Pts	
Fully accurate results, following all specifications <a href="#">view longer description</a>	Works the first time. 70.0 pts	Works on the 2nd try 65.0 pts	Works on the 3rd try 60.0 pts	Works after 4 or more tries. 50.0 pts	Doesn't work after 2 weeks. Partial credit. 20.0 pts	Not submitted within two weeks of the due date. 0.0 pts	Work is not original -- appears to be a marked-up copy of the work of another or previous student. 0.0 pts		70.0 pts	
Submits all work on time, fully complete if not fully correct. <a href="#">view longer description</a>	Submitted on time 20.0 pts	Submitted on time, but one or more files are missing or not correctly named. 16.0 pts			Submitted on time, but with missing identification in one or more submitted CPP or H files. 15.0 pts		Submitted on time but not fully complete. 10.0 pts	Late or wholly incomplete! 0.0 pts	20.0 pts	
Well-organized and professional quality code. <a href="#">view longer description</a>	Fully meets expectations 10.0 pts	Mostly meets expectations, just needs to be a bit more careful. 8.0 pts			Many areas are well done, but there are a lot of areas that need work. 6.0 pts		Getting there, but needs to be a lot better. 3.0 pts	Needs a lot of work. See the instructor for guidance. 0.0 pts	10.0 pts	
Total Points: 100.0										