Welcome to Leetcode Study Group!

Before we begin...

- Session materials:
  https://github.com/WomenWhoCode/WWCodePython

- Set your chat to “All panelists and attendees” and share your thoughts there

- Ask any questions using the Q&A button

- Have fun and make some coding friends!

WELCOME

WOMEN WHO CODE

Our Mission

Inspiring women to excel in technology careers.

WOMEN WHO CODE PYTHON

Our Vision

A world where diverse women are better represented as engineers and tech leaders

WOMEN WHO CODE PYTHON

Our Values

+ Focus on the mission
+ Live Leadership
+ Punch above your weight
+ Inclusion at the core

WOMEN WHO CODE PYTHON

Our Target

Engineers with two or more years of experience looking for support and resources to strengthen their influence and levelup in their careers.

WOMEN WHO CODE PYTHON

290,000

Members

70 networks in 20 countries
122+ countries
14K+ events
$1025 daily Conference tickets
$2M Scholarships
Access to jobs + resources
Infinite connections

WOMEN WHO CODE PYTHON

OUR MOVEMENT

As the world changes, we can be a connecting force that creates a sense of belonging while the world is being asked to isolate.

WOMEN WHO CODE PYTHON

Code of Conduct

WWCode is an inclusive community, dedicated to providing an empowering experience for everyone who participates in or supports our community, regardless of gender, gender identity and expression, sexual orientation, ability, physical appearance, body size, race, ethnicity, age, religion, socioeconomic status, caste, creed, political affiliation, or preferred programming language(s).

Our events are intended to inspire women to excel in technology careers, and anyone who is there for this purpose is welcome. We do not tolerate harassment of members in any form. Our Code of Conduct applies to all WWCode events and online communities.

Read the full version and access our incident report form at
womenwhocode.com/codeofconduct

WOMEN WHO CODE PYTHON

WOMEN WHO CODE®

/connect

CONNECT Forward 2021

Join the largest and most active community of technical women for two days of career advancement, connection, and more!

REGISTER

November 18 & November 19, 2021

Register here:

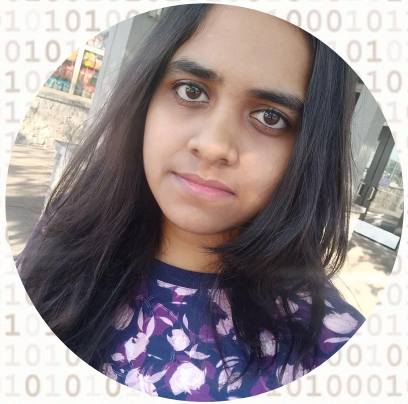
Get 50% off your Member ticket!

Promo Code: **WWCODEPYTHON**

LeetCode Study Group

WOMEN WHO CODE PYTHON

Meet Your Team!

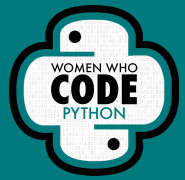


Chethana
Lead / Associate Software Engineer

Karen
Lead / Programmer

Today's Agenda

1. Introduction to DFS and BFS
2. Deep dive of Number of Islands
    a. Problem Discussion
    b. Test cases
    c. Approaches with time complexity
    d. Live coding
3. Next problems to tackle
4. Q&A

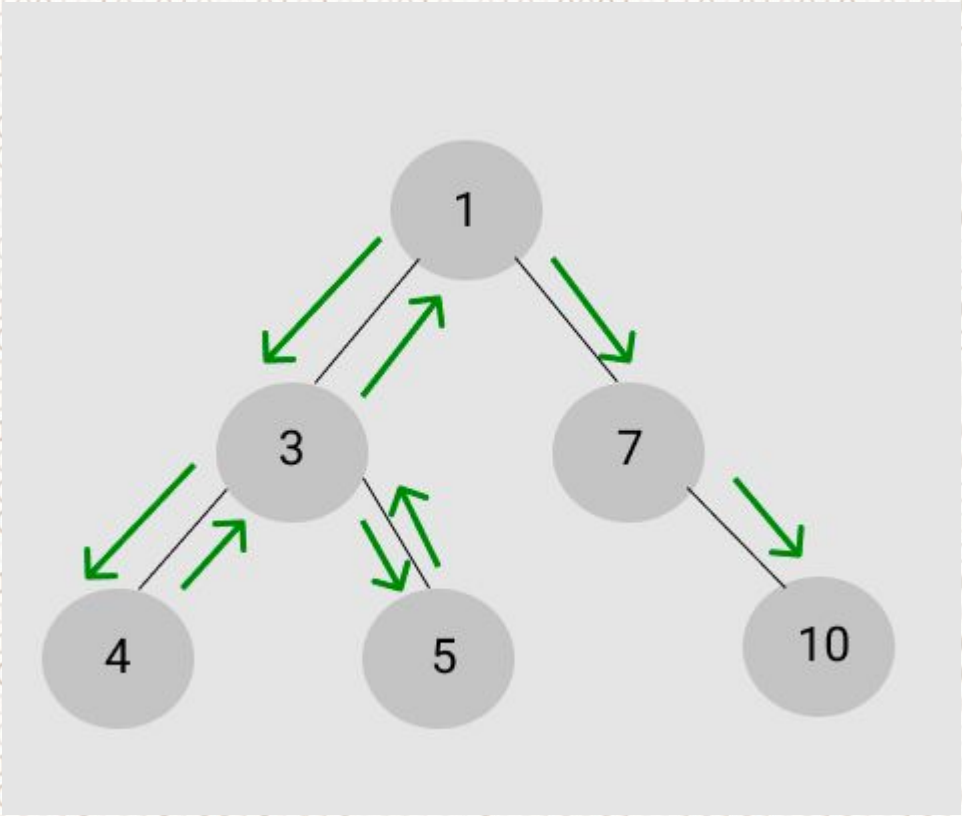


Depth First Search (DFS)

Quick intro

- DFS is a algorithm to search or traverse a graph or a tree
- Mostly seen used in these types of problems in Leetcode
- You go deep down a path, explore it completely and then come back up and explore a different path until the end
- Done recursively(which uses the call stack), but to replicate iteratively, can use a Stack

How?



Let's take a Binary Tree

DFS - Inorder Traversal

Order => Left, Root, Right (recursively)

4, 3, 5, 1, 7, 10

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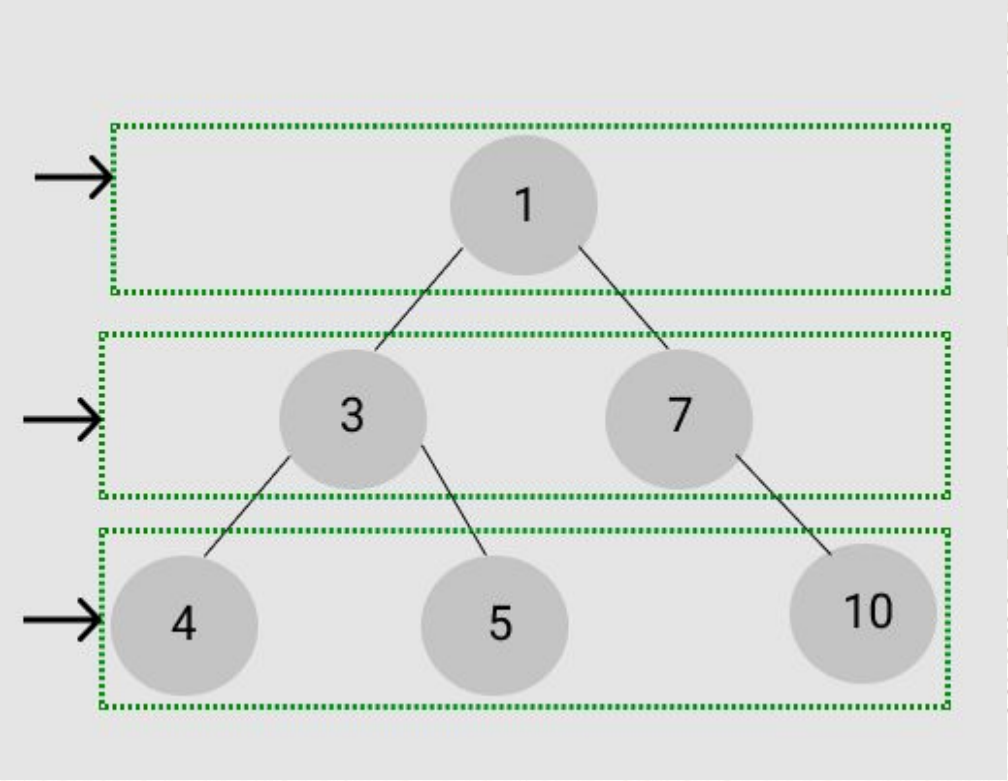
Breadth First Search (BFS)

Quick Intro

- Algorithm to search or traverse a graph or a tree
- Only difference => keep track of visited path and keep going down, no need of going back up the path
- Mostly done iteratively using a Queue
- Can try to do it recursively as well (but doesn't make sense logically)

How?



- Same tree
- BFS/ Level order traversal
- Go level by level
- 1, 3, 7, 4, 5, 10

Where and when to use?

- Both can be used anywhere we need to “find” something by going over a tree, graph mostly
- DFS when you need to look at various possible solutions and not the closest or quickest one, ie when exhaustive exploration is needed
- BFS when you know you need the shortest path to the node or the closest vertex from the current vertex, ie when to find solutions quickly

Differences

- DFS explores a path to the end but may keep revisiting and backtracking to the root to go down another path
  - Memory used may be less, may also be stuck within an infinite loop without reaching solution

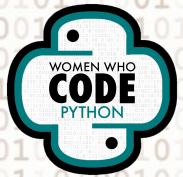
- BFS keeps tracks of the closest nodes or paths to the vertex that it sees within that level and continues
  - Queue to keep track
  - May not need to revisit already visited nodes or vertices

Number of Islands

Link to problem

"Given an `m x n` 2D binary grid `grid` which represents a map of `'1'`s (land) and `'0'`s (water), return the number of islands.

*An **island** is surrounded by water and is formed by connecting adjacent lands horizontally or vertically. You may assume all four edges of the grid are all surrounded by water.*
"

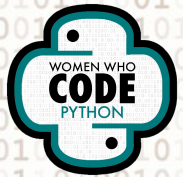


Simplifying that

- Input - 2D grid of “1”s and “0”s => “0”s (water) and “1”s (land)
- Output - Number of islands
- Island?
  - 1’s connected horizontally or vertically
  - Not diagonally

How many islands here?

[[“1”, “0”, “1”, “1”, “0”],
[“1”, “1”, “0”, “0”, “0”],
[“1”, “1”, “1”, “0”, “0”]]



Let's Code!

https://replit.com/@codernewbie/WWCodePythonLeetcode

Next steps from here

For **DFS**

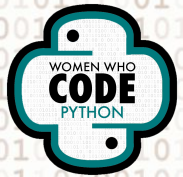
- Tree traversals (inorder, preorder, postorder)
-

For **BFS**

- Level order tree traversal

In general, start with them in trees, then matrices, then graphs
Also, try to do these iteratively and recursively

Validate Binary Search Tree



QnA Time!

Useful Links

- Leetcode Study group repo
- Repl link
- Mock interview - Pramp
- Leetcode Weekly contest (and biweekly)

Stay Connected!

WOMEN WHO CODE PYTHON

JOIN US ON SOCIAL MEDIA!

@WWCODEPYTHON

WOMENWHOCODE.COM/PYTHON

Upcoming Sessions

- ➔ Jan 20 - Backtracking
- ➔ Feb 3 - Bonus session 1
- ➔ Feb 17 - Bonus session 2

Upcoming Events

SAT
11
DEC

Member Meet & Greet! - Women Who Code Python *Featured*

Online | Python | 10:00 AM - 11:30 AM CST (UTC-0600)

Register

WED
15
DEC

WWCode Digital Track End of Year Party

Online | Python | 1:00 PM - 2:00 PM CST (UTC-0600)

Register

Register at: https://www.womenwhocode.com/python/events

Thank You for Joining!