Data Structures & Algorithms Syllabus

Contact Info

While going through the program, if you have questions about anything, you can reach us at support@udacity.com. For help from Udacity Mentors and your peers visit the Udacity Classroom.

Nanodegree Program Info

In this course you will learn data structures and algorithms by solving 100+ practice problems. You will begin each course by learning to solve defined problems related to a particular data structure and algorithm. By the end of each course, you will be able to evaluate and assess different data structures and algorithms for any open-ended problem and implement a solution based on your design choices.

Version: 1.0.0

Length of Program: 101 Days*

** This is a self-paced program and the length is an estimation of total hours the average student may take to complete all required coursework, including lecture and project time. Actual hours may vary.*

Part 1: Introduction

Start with a warm welcome to the program by refreshing your Python skills and learning about problem solving and efficiency!

Project: Unscramble Computer Science Problems

Deconstruct a series of open-ended problems into smaller components (e.g, inputs, outputs, series of functions).

Supporting Lessons

Lesson	Summary
Introduction	Welcome to the Data Structures and Algorithms nanodegree program!
Python Refresher	A quick refresh on Python basics!
How to Solve Problems	A systematic way of approaching and breaking down problems.
Efficiency	Understanding the importance of efficiency when working with data structures and algorithms.

Part 2: Data Structures

Learn about the core data structures used in programming.

Project: Show Me the Data Structures

Solve a series of open-ended practice problems. Hone your skills to identify and implement appropriate data structures and corresponding methods that meet given constraints.

Supporting Lessons

Lesson	Summary
Arrays and Linked Lists	Learn about Arrays and Linked Lists
Stacks and Queues	Build Stacks and Queues
Recursion	Apply Recursion to Problems
Trees	Learn about basic tree's, tree traversal and binary search trees.
Maps and Hashing	Explore the concepts of maps and hashes.

Part 3: Basic Algorithms

Learn about the basic algorithms used in programming.

Project: Problems vs. Algorithms

A series of real-world open ended problems which train you to apply suitable data structures and algorithms under different context.

Supporting Lessons

Lesson	Summary
Basic Algorithms	Start out with some elementary algorithms such as binary search, tries, heaps and more.
Sorting Algorithms	Learn about the most common sorting algorithms.
Faster Divide & Conquer Algorithms	Go deeper into algorithms with faster divide and conquer algorithms.

Part 4: Advanced Algorithms

Learn about the basic algorithms used in programming.

Project: Route Planner

In this project, you will build a route-planning algorithm like the one used in Google Maps to calculate the shortest path between two points on a map.

Supporting Lessons

Lesson	Summary
Greedy Algorithms	Get familiar with and practice greedy algorithms.
Graph Algorithms	Learn about the many aspects of graph algorithms!
Dynamic Programming	Learn about dynamic programming and apply your learnings to challenging exercises.
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Part 5: Career Services

These Career Services will ensure you make meaningful connections with industry professionals to accelerate your career growth - whether looking for a job or opportunities to collaborate with your peers. Unlike your Nanodegree projects, you do not need to meet specifications on these Services to progress in your program. Submit these Career Services once, and get honest, personalized feedback and next steps from Udacity Career Coaches!

Project: Improve Your LinkedIn Profile

Find your next job or connect with industry peers on LinkedIn. Ensure your profile attracts relevant leads that

will grow your professional network.

Supporting Lessons

Lesson	Summary
Industry Research	You're building your online presence. Now learn how to share your story, understand the tech landscape better, and meet industry professionals.

Project: Optimize Your GitHub Profile

Other professionals are collaborating on GitHub and growing their network. Submit your profile to ensure your profile is on par with leaders in your field.

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Generated Mon Aug 24 20:52:11 PDT 2020