Programming Fundamentals & Algorithms

Overview

Knowledge of programming and technology is becoming exponentially important as time goes on. Organisations are increasing the use of software-oriented tools like **Machine Learning** and **Enterprise Applications** in order to gain a competitive edge.

Whether as a **hobby**, **past time**, or **professional skill**, the place to start is with the fundamental concepts of programming.

Key Outcomes

1. A strong foundation in programming, learnt through the **Python** language
2. Learn how to adopt **computational thinking** practices when solving problems, a skill not exclusive to the software industry
3. An understanding of **Data Structures and Algorithms**, concepts which are key tenets in the world of software
4. Be prepared to venture into practical fields such as **App Development** and **Machine Learning**

Who Should Attend?

This course is designed for individuals with knowledge of the foundational programming methodologies who are now looking to take the next step: gaining a problem solving aptitude in the context of programming.

If you are looking to enter fields such as **Machine Learning** or **App Development**, we encourage you take this course first to ground your core knowledge!

You should be familiar with the following topics before joining this course: **Variables, Data Types, Logic, Arrays, Functions, File Reading.** You should also be familiar with these topics in the Python programming language

Course Information

- As of November 2021, all courses be **conducted online**, over Zoom.
- There are a total of 6 lessons in this course.
- Each lesson will be conducted on Saturday, for a duration of **3 hours.**
- Class sizes are maximally 15 students with 2-3 teachers
- There are **no replacement lessons**, but each lesson will be video recorded and submitted to students who miss lessons

Programme Curriculum

CodeIT Essentials 1: Data Structures & Algorithms (6 Lessons)

LESSON 1: 2D LISTS & LOOPS	• Learn how to handle **multi-dimensional lists and loops** • Implement a program to simulate the widely popular game: tic-tac-toe
LESSON 2: ALGORITHMS 1	• Discover the elegance of programming with **recursion, search and sort** • Implement a program to discover mutal friends in a social network!
LESSON 3: ALGORITHMS 2	• Further your study of algorithms with an industry standard sort method: **merge sort** • Implement a program to apply an instagram like filter on photos!
LESSON 4: OBJECT-ORIENTED PROGRAMMING	• Learn about one of the most popular programming paradigms in the industry • Implement features of Instagram such as user login and signup!
LESSON 5: LINKED LISTS	• Learn the most foundational data structure: the **Linked List**. • Implement features of web navigation through applications of Linked Lists
LESSON 6: BINARY SEARCH TREES	• Experience the creative nuance of data structures through the **Binary Search Tree** • Implement a Fifa player search program with Binary Search Trees!

Look Forward To

Small Group Sizes

Students are assigned into groups of 4-6, each mentored by one teacher, for just the right mix of collaboration and independence.

Expertise

Our teachers go through a stringent selection processs and training module to ensure that you are being taught not just by the best programmers, but the best educators!

Collaborative Environments

Physically and virtually. We integrate google drive-like programming environments such that students and teachers can live code together!

Applicability

Learn about how programming is applied to other fields such as linguistics, finance and even photography! It is important not just to know how to code, but why you

About Us

CodeIT was started in 2021, with a goal to profilerate education in the field of programming and Computer Science. We were founded upon three tenets:

Premium

We aspire to deliver education of the highest standards that will prepare our students adequately to help them achieve their goals. To do so, we focus on choosing the right topics, we focus on selecting the right teachers, and we focus on designing the best delivery.

Accessible

Premium does not mean inacessible. We believe that everyone should have the opportunity to break into the world of programming and software, regardless of where you come from. This is why we deliver our course not just commercially, but work with volunteers to provide our course to several communities!

Fundamental

Mastery over basics are what separates the good from the bad. We believe in honing the skills that will stick with you for a lifetime, and this means focusing on algorithms, data structures and computational thinking. These are the principles upon which our software world was developed.

CodeIT Academy

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