Introduction to Java

Presented by AcademiaEdge

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Date and Timings: 6/11 - 8/27 on Friday from 7-8 P.M. EST
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Requirements: Students must have a personal Gmail account to access google classroom and class materials. Recommended for students ages 11 and up. But any student may join if interested.

Class Description:

This Introduction to Java class is a complete introduction to Java for beginners! In this class, we'll learn the syntax and structure of Java, all about functions and classes, and build a couple of cool projects on the way! I'll assign exercises from W3Schools during the course. Students can ask questions at any time during the class and the assistant or teacher will answer them. Additionally, students may message teachers via google classroom or by email and our teachers will respond as soon as possible. In order to give this individualized experience filled with fun projects and assignments guided towards students, classes will be limited to 10-20 students so that teachers can give high-quality attention to each student. Sign up is first come first serve and a waitlist may be created if there is excessive student participation. This course is guided towards students of grades 6 and up, but any student may join if interested.

Syllabus:

First Class Schedule:

15 minutes	What is Java, and what is an Object-Oriented Programming Language?
15 minutes	Setting up the Java IDE
10 minutes	The main method, printing, and commenting
5 minutes	Summary

Second Class Schedule:

30 minutes	Main Java primitive types: int, long, double, string, Boolean
5 minutes	Casting from one type to another and combining types.
15 minutes	Arithmetic in Java and changing variables

General Class Schedule:

10 minutes	Review last week's homework + Questions
40 minutes	Lecture or Project Work
5 minutes	Summary and Assign Homework

Course Content

1. Introduction to Java
    a. What is Java, and what is an Object-Oriented Programming language?
    b. Setting up the IDE
    c. The main method
2. Basics of primitive types and variables
    a. Introduction to variables in Java
    b. Introduction to int,long,double,boolean,string
    c. Casting from one type to another. “Rule of Narrowing”.
    d. Variable operations
3. Strings, Math, and Booleans
    a. Strings in Java and fundamental methods.
    b. String concatenation.
    c. Java math library and fundamental functions. Randomness in Java.
    d. An introduction to boolean logic
    e. Coding Assignment #1
4. If-Else Logic
    a. If, Else, Else if statements in Java
    b. && and || and! (and,or,not) in java.
    c. Upgrade Coding Assignment#1
5. Loops and Arrays
    a. Introduction to the For loop
    b. Introduction to the While loop
    c. Break and continue commands
    d. Introduction to arrays
    e. Array construction and indexing and sorting
    f. Coding Assignment #2
6. Introduction to Functions in Java
    a. Why use functions?
    b. Defining functions.
    c. Passing in parameters.

    d. Variable scope.
    e. Basic recursion with functions.
    f. Begin Work on Project: Tic Tac Toe
7. Object-Oriented Programming
    a. Classes and Objects
    b. Class Attributes and Methods
    c. Class Constructors
    d. Java Scanner (Standard In, and Standard Out)
    e. Finish the basic Project: Tic Tac Toe
8. Next Level Tic Tac Toe
    a. Play Tic Tac Toe on an NxM board, with K pieces in a row needed to win.
    b. Fix bugs and prevent illegal moves from being made.
9. Inheritance and Polymorphism
    a. Why use inheritance and polymorphism with Java classes?
    b. Defining objects via inheritance
    c. Using super() in constructors
    d. Work on Coding Assignment#3
10. Basic Java Data Structures and Threading
    a. ArrayLists, LinkedLists, HashMap, HashSets, Queues
    b. Threading in Java
    c. Work on Coding Assignment #4
    d. Discuss the Final Project
11. Review and Work on Final Project
    a. Review everything covered in the course
    b. Begin collaboratively working on the Final Project using Repl.it.
12. Final Project Show and Tell
    a. Share final projects with classmates.
    b. Offer constructive feedback.

Rules and Expectations

Classroom Procedures:

Students are to stay muted at all times except if they have a question or when asked to be unmuted. The student may temporarily unmute himself to ask his/her question. Alternatively, if the student would not like to speak in front of the class, then the student may ask his/her question in the Zoom chat. We encourage students to ask questions and regularly participate in class. Also, we would like students to be respectful to their classmates and teachers.

Students, please do not:

- Eat or drink with your microphone turned on
- Be disrespectful to teachers or other students
- Put inappropriate pictures on your webcam
- Send inappropriate messages in the class chat

Please do:

- Ask questions
- Be attentive
- Be engaged and active throughout the class
- Make sure to have your camera on throughout the class
- Do assignments thoroughly
- Submit assignments before the deadline
- Have Fun!

Google Classroom Layout:

Each lesson's recording will be found on google classroom along with the class's slides and notes. Homework assignments will be assigned and submitted via google classroom as well. Students can ask questions through the messaging system in google classroom or via email.

Homework procedures:

Students will be given homework in google classroom via google docs, which will consist of inserting screenshots or short-answer/multiple-choice questions, or google forms. The google forms will mainly be used for knowledge checks, while the google docs will be used for general homework assignments. Each assignment is due 24 hours before the next class to give ample time for teachers to grade students' assignments. Students should send a message or an email if they are unable to turn in their homework by then with a valid explanation of why they will not be able to turn in their homework by the deadline, and the teachers will come up with a possible solution. This also applies to missing a class. Course projects will also be assigned and submitted through Google Classroom. If a student misses an assignment deadline repeatedly an email will be sent to his/her parents.