Matt’s Basic Introduction to Programming

A short intro to what programming is.

What is Programming?

A program can be described abstractly as *“A set of discrete instructions that produce a desired output.”* By this definition, many things in life are programs; Cooking with a recipe, following DIY steps, etc. **Programming** on the other hand is the act of creating these steps. Following our examples from before, **Programming** would be like writing out the recipe for a dish, or creating the DIY steps.

When **Programming**, it is good to first envision the *goal* you desire, then find the steps to solving it.

(p.s. All bolded words are defined on the last slide!)

Will I Enjoy Programming?

Depends on your overall goal. Are you learning for fun? Or are you learning for a job, school, or even a personal project? The most important part of programming is the creation of the program. If you focus too hard on wanting the *desired output* that you lose sight of the *process*, you end up hating it.

When first programming, it’s important to consider what you will *learn* from it, not what you will *make* from it.

Getting Started Programming -The Basics

For any language you pick you will need some text editor to type your code in. I personally use Notepad++

https://notepad-plus-plus.org/downloads/

More often than not people will use what's called a IDE (integrated development environment). These can streamline many processes, and are good to learn. This slideshow though will use the bare tools so that you get the most grounded understanding.

You will also need to understand basic Powershell/Command Prompt. Everything we use will be explained as it shows up.

Getting Started Programming -Goals

By now you should have a text editor installed, the next step is to decide on which language to code in. The next slide will explain some key differences that will help you make your decision.

You’ve completed the first step in starting to program! Good job!

Getting Started Programming -Language Types

You most likely will be familiar with popular languages, such as Java, C++, Python, Javascript, etc. You may wonder though, *what's the difference?* Well, there are two main differences in programming languages; **Compiled** and **Scripted** language types.

In the next two slides, we will cover what these mean.

Compiled Languages

Compiled Languages are languages that require a separate software called a *Compiler* to allow the code to run on a machine. Compilers need to be designed for a specific **Processor** *(CPU)*, since they turn the code you write into **Machine Code**. Compiled languages are the oldest, some examples are C++, Java*, Fortran, Pascal, etc. It is good to start with a compiled language since there is typically a lot of information online about them.

*Java is a special type of compiled language that will be explained later

Scripted Languages

Scripted Languages are becoming more popular as of late. A scripted language uses an **Interpreter** instead of a compiler to execute its code. This works by reading your program and executing **Keywords**. Common examples of scripted languages are Python, Javascript, Lua, etc. Scripted languages are good to start with since they don’t require compiling, making editing and testing easier.

The Big Languages

By now you should pick a language to start with, here are my recommendations:

Compiled:

Java: Easiest language to start with due to its features and documentation
Click Here To Jump
C++: Harder than java, but many languages are based off of it.
Not Covered

Scripted:

Javascript: Runs on every PC with a web browser. Also has tons of **Libraries**
Click Here To Jump
Python: Another simple language, has a bit more power than Javascript
Not Covered

Java

For Java, you first need to download the Java JDK and Java JRE.

https://www.oracle.com/java/technologies/downloads/#jdk17-windows

Java is special in that it is run on the Java Virtual Machine, which is included in the JRE. This means that you can give another computer a compiled Java file, and they can easily run it. Once you have it installed, you can start programming with it.

If you selected Java, you can go to the Java slideshow to start programming!

Javascript

If you have any web browser, you technically already have a Javascript interpreter. If you want a dedicated Interpreter though, you can use Node.js

https://nodejs.org/en/download/

Node.js is a Javascript **Framework** which gives it several boosts and is typically used for **Backend** server development.

If you selected Javascript, go to the Javascript slideshow to start programming!

Definitions

Programming - Creating a program (sequence of steps that give a desired output).
Compiled - A language that is turned into Machine Code to run on a specific processor.
Scripted - A language that is read literally from the file by an interpreter.
Machine Code - Binary that a processor can understand.
Processor - The computer component that interprets machine code.
Interpreter - A piece of software that can execute a scripted language.
Keywords - Words of a language that are reserved for the language that typically have special meaning.
Library - A collection of functions you can use in a program to do micro-tasks.
Framework - A variation of a language that gives it additional features.
Backend - The code server side that processes data.