Coding for the Absolute Beginner

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Course Hours (hopefully 1.5 – 2 hours) x ~10 weeks

Course Overview:

The aim of this course is to introduce students to the basic concepts of computer programming ("coding"), and to give them the tools and experience to explore the coding landscape on their own.

Students will learn basic coding skills by writing simple programs

Target Audience:

People interested in learning the basics of coding, and python computing language.

Pre-reqs:

- Basic computing skills such as:
    - Ability to navigate the file system
    - Basic typing, ability to use a text editor (copy/cut/paste/etc..)
    - Basic math skills (functions)
    - Access to a computer

Learning Objectives:

At the end of the course students will be able to:

- Understand basic programming concepts and how they are used including:
    - Assignment and variables
    - Basic types (int, float, bool, string)
    - Conditional Statements (if, elif, else, and, or)
    - Loops (for, while, do-while, enhanced-for)
    - Basic data structures (Arrays, Dictionaries)
    - Functions
    - Basic Objects
    - Try / Except and Exceptions, Debug mode, step into, step through, step out
    - File I/0, user I/0
    - Libraries / Imports
    - Basic OOP concepts: Inheritance, Abstraction, Encapsulation, Polymorphism
- Write simple python programs.
- Have basic knowledge of the console and how it is used.
    - Running a script from console
    - Installing libraries from console
    - Interacting with and navigating the file system from console
- Be able to find additional resources for continued learning
    - Internet resources
    - Know how where to look for popular coding topics (Website creation, Frameworks, databases, etc...)

This course will have several modules, they are:

- Module 0: Very basics including: what is code? What is python? Setup computers (if applicable) see: https://thonny.org, More about the course.
- Module 1: Basic Types, Basic syntax and Casting
- Module 2: Basic data structures (List, Dictionary)
- Module 3: Conditional Statements + Loops
- Module 4: Functions (including recursion) + Debug mode
- Module 5: Basic Objects (Classes)
- Module 6: I/0 and files + Try/Except
- Module 7: Libraries
- Module 8-9: OOP: abstraction, encapsulation, inheritance (including overriding and overloading), polymorphism
- Module 10 (optional): The console, Version Control

Together, we will work step-by-step through each module. This should take 1 – 1.5 hours for each module, I will spend the remainder of the time working hands on with students/attendees on practice problems.