**Python for Kiddos - Phase I**

**Fall 2023**

**HXCS@Mason**

**Course Lecturer**

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**Course Overview**

The objective of this course is to expose students to programming, algorithmic design, and computational thinking at a basic level using Python as the programming language. This course features an extremely gentle learning curve for students with no or little programming background. Lectures will be delivered with intensive interactions between the instructor/TA and students at a very slow pace. The design of this course assumes students with basic math background (e.g., with a math level >= the 4th grade). There will be at least one programming assignment after each lecture.

**Course Learning Objectives**

After completing this course, a student should be able to

1. understand essential programming concepts such as syntax, variables, and data types,
2. understand basic operators,
3. program with basic user input/output methods,
4. program with essential programming structures such as branches and loops,
5. program with array and list,
6. understand and apply functions,
7. apply the learned knowledge to solve elementary math challenges.

**Textbook**

This course ***does not require*** any specific textbook.

**Schedule (Tentative)**

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| **Week** | **Topic** | **Comments** |
| 1 | Introduction | Programming environment |
| 2 | Variables, values, data types, and simple math operators | Swap two variables, int, float, boolean, string, addition, minus, multiplication, division, mod |
| 3 | Boolean value and boolean operators | True/False, AND, OR, >, <, ==, != |
| 4 | Strings and casting | Convert strings to int, float, boolean, and vice versa. |
| 5 | Basic user input and outputs | An example of implementing a simple calculator with two variables. |
| 6 | If-Else | indentation |
| 7 | Nested If-Else |  |
| 8 | While Loops |  |
| 9 | Nested Loops |  |
| 10 | Array/List | Enumerate all elements, find the largest element |
| 11 | Functions | And a few built-in functions |
| 12 | Application 1 | Implement your own dividing |
| 13 | Application 2 | Finding greatest common divisor |
| 14 | Application 3 | The 36 problem from Mason GPS program |
| 15 | Application 4 | The hangman game |
| 16 | TBD |  |