Course Duration: 2 months

Chapter 1: Programming in Python

- Gain an overview of what you'll be learning and doing in the course
- Understand programming and why you should learn programming in Python

Chapter 2: Data types and Operator

- Learn about Python data types
    - Integers
    - String
    - Boolean
    - Float
    - List
    - Tuple
    - Sets
    - Dictionaries
    - Compound data structures
    - Type casting
- Learn about variable
- Input/Output
- Learn about:
    - Arithmetic operator
    - Logical operator
    - Comparison operator
    - Logical operator
    - Membership
    - Identity
- Practice
    - Declare, assign and reassign value to a variable
    - Modify values using built in functions and methods
    - Practice whitespace and style guidelines
    - Write a function that accepts an integer n and a string s as parameters, and returns a string of s repeated exactly n times.
      Example
      3, "Hello" —->>>> "HelloHelloHello"
    - Given a random non-negative number, you have to return the digits of this number within an array in reverse order.
      Example:
      35231 => [1,3,2,5,3]
    - Write a function to convert a name into initials. This problem strictly takes two words with one space in between them.

Example:
Sam Harris => S.H

- Your goal is to create a function that removes the first and last characters of a string. You're given one parameter, the original string. You don't have to worry with strings with less than two characters.
  Eloquent —->>> loquen
- You will be given an array a and a value x. All you need to do is check whether the provided array contains the value. Return true if contains value otherwise false.
- We need a function that can transform a number (integer) into a string.
  Example 100 ⇒ “100”, -100 ⇒ “-100”
- Complete the solution so that it returns true if the first argument(string) passed in ends with the 2nd argument (also a string).

Chapter 3: Control flow

- Learn about why conditions are needed? What is meant by control flow?
- Learn about
  - If
    - If else
    - If elif else
  - Ternary Operator
- Learn about loop:
  - For
  - While
  - continue
  - break
  - List comprehension

Chapter 3: Functions

- What are functions in Python?
- Function arguments
- Variable scope
- Document a function using Doc strings
- Learn about iterator and generator
- Python pass statement
- Practice
  - Create a method to add, subtract, multiply, and divide. Take both number and operator as an input from the user. Method will return the answer.
  - Create a function that takes an integer as an argument and returns "Even" for even numbers or "Odd" for odd numbers.
  - You probably know the "like" system from Facebook and other pages. People can "like" blog posts, pictures or other items. We want to create the text that should be displayed next to such an item. Implement the function which takes an array containing the names of people that like an item. It must return the

display text as shown in the examples:
[] --> "no one likes this"
["Peter"] --> "Peter likes this"
["Jacob", "Alex"] --> "Jacob and Alex like this"
["Max", "John", "Mark"] --> "Max, John and Mark like this"
["Alex", "Jacob", "Mark", "Max"] --> "Alex, Jacob and 2 others like this"

- Make a function that will return a greeting statement that uses an input; your program should return, "Hello, <name> how are you doing today?".
- Write a function which returns the sum of each number squared. For example: [1,2,3] —> 1^2 + 2^2 + 3^2 = 14

Chapter 4: Classes

- Learn about OOP and OOP concepts
- Learn about classes in Python
- Learn about:
  - Init method
  - Class method
  - Member method
  - Self attribute
  - Instance
  - Inheritance
  - Polymorphism
- Practice:

Chapter 5: Exceptions Handling

- Learn about:
  - Exception handling with try
  - Handling multiple exceptions
  - Writing your own exceptions

Chapter 6: File Handling

- Learn about:
  - Open a file
  - Close a file
  - Write to a file
  - Reading from file

Python practice question

Problem #1

A pangram is a sentence that contains every single letter of the alphabet at least once. For example, the sentence "The quick brown fox jumps over the lazy dog" is a pangram, because it uses the letters A-Z at least once (case is irrelevant).
Given a string, detect whether or not it is a pangram. Return True if it is, False if not. Ignore numbers and punctuation.

Input: "The quick, brown fox jumps over the lazy dog!"
Input2: "1bcdefghijklmnopqrstuvwxyz"

Problem #2

Make number negative

In this simple assignment you are given a number and have to make it negative. But maybe the number is already negative?

Input: -100
Input2: 0
Input3: 3
Input4: 34

Problem #3

Two to one
Take 2 strings s1 and s2 including only letters from a to z. Return a new **sorted** string, the longest possible, containing distinct letters - each taken only once - coming from s1 or s2.
Example
a = "xyaabbbccccdefww"
b = "xxxxyyyyabklmopq"
longest(a, b) -> "abcdefklmopqwxy"

a = "abcdefghijklmnopqrstuvwxyz"
longest(a, a) -> "abcdefghijklmnopqrstuvwxyz"

Problem #4

Opposite number
Very simple, given an integer or a floating-point number, find its opposite.
Example:
1: -1

14: -14
-34: 34

Problem #5

Keep Hydrated
Nathan loves cycling.
Because Nathan knows it is important to stay hydrated, he drinks 0.5 litres of water per hour of cycling.
You get given the time in hours and you need to return the number of litres Nathan will drink, rounded to the smallest value.

Example
time = 3 ----> litres = 1
time = 6.7---> litres = 3
time = 11.8--> litres = 5

Problem #6

You will be given an array of numbers. You have to sort the odd numbers in ascending order while leaving the even numbers at their original positions.
Example:
[7, 1] => [1, 7]
[5, 8, 6, 3, 4] => [3, 8, 6, 5, 4]
[9, 8, 7, 6, 5, 4, 3, 2, 1, 0] => [1, 8, 3, 6, 5, 4, 7, 2, 9, 0]

Problem #7

Given two integers a and b, which can be positive or negative, find the sum of all the integers between and including them and return it. If the two numbers are equal return a or b.
Example:
(1, 0) --> 1 (1 + 0 = 1)
(1, 2) --> 3 (1 + 2 = 3)
(0, 1) --> 1 (0 + 1 = 1)
(1, 1) --> 1 (1 since both are same)
(-1, 0) --> -1 (-1 + 0 = -1)
(-1, 2) --> 2 (-1 + 0 + 1 + 2 = 2)

Problem #8

Can you find the needle in the haystack? Write a function findNeedle() that takes an array full of junk but containing one "needle" After your function finds the needle it should return a message (as a string) that says: "found the needle at position " plus the index it found the needle, so:

Example:
["hay", "junk", "hay", "hay", "moreJunk", "needle", "randomJunk"] --> "found the needle at position 5"

Problem #9

Write a program that finds the summation of every number from 1 to num. The number will always be a positive integer greater than 0.
Example:
summation(2) -> 3
1 + 2

summation(8) -> 36
1 + 2 + 3 + 4 + 5 + 6 + 7 + 8

Problem #10

Given the triangle of consecutive odd numbers:

```
           1
        3     5
     7     9    11
  13    15    17    19
21    23    25    27    29
```

Calculate the sum of the numbers in the nth row of this triangle (starting at index 1) e.g.:
(Input --> Output)
1 --> 1
2 --> 3 + 5 = 8

Problem #11

In this kata you are required to, given a string, replace every letter with its position in the alphabet.

If anything in the text isn't a letter, ignore it and don't return it.

For example ‘a’=1, ‘b’=2, etc
"The sunset sets at twelve o' clock." => "20 8 5 19 21 14 19 5 20 19 5 20 19 1 20 20 23 5 12 22 5 15 3 12 15 3 11"

Problem #12

You were camping with your friends far away from home, but when it's time to go back, you realize that your fuel is running out and the nearest pump is 50 miles away! You know that on average, your car runs on about 25 miles per gallon. There are 2 gallons left. Considering these factors, write a function that tells you if it is possible to get to the pump or not.
Function should return true if it is possible and false if not.

Problem #13

Jaden Smith, the son of Will Smith, is the star of films such as The Karate Kid (2010) and After Earth (2013). Jaden is also known for some of his philosophy that he delivers via Twitter. When writing on Twitter, he is known for almost always capitalising every word. For simplicity, you'll have to capitalise each word, check out how contractions are expected to be in the example below.
Your task is to convert strings to how they would be written by Jaden Smith. The strings are actual quotes from Jaden Smith, but they are not capitalised in the same way he originally typed them.
Example:
Not Jaden-Cased: "How can mirrors be real if our eyes aren't real"
Jaden-Cased: "How Can Mirrors Be Real If Our Eyes Aren't Real"