Python Programming Workshop Session 1

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https://avnithv.github.io/

About Me - Avnith Vijayram

I am an eighth grader at Rachel Carson Middle School.

This is my fourth year of participation in ACSL

I have learned to program in Python and Java.

I enjoy playing chess, reading books, hiking, biking and programming.

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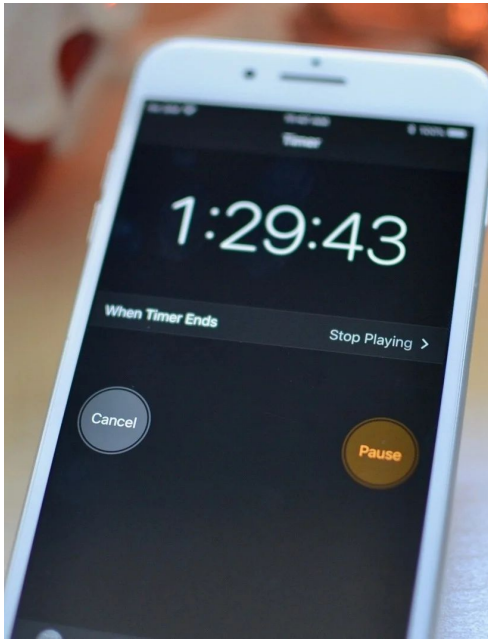
Computer Program

Set of instructions for a computer

Written in a programming language

Human readable

Does a task



Programming Language

Human readable language.

Computers can understand only 0s and 1s

Programs are translated into 0s and 1s

Interpreted vs Compiled

3 popular languages - Java, C++, Python

Python

Interpreted programming language

Emphasizes readability

Created by Guido van Rossum in 1991

Latest version - Python3

Has a wide variety of applications

Writing Programs

Integrated Development Environment - IDE

Repl is an IDE

Lets you write, run, and store code

How to use Repl → https://repl.it/

Hello, World!

Simplest Python program

print() function outputs the sentence

“Hello, world!” is a string

helloworld.py

```
1   print('Hello, world!')
```

Input() and Print()

input() function takes input from user

Data is processed

print() function writes output to user

You can use this to communicate with the user

reply.py

```
1   name = input('Enter your name: ')
2   reply = 'Hello, ' + name + '!'
3   print(reply)
```

Basic Data Types

Data Types:

Int - An integer

Float - A number with a decimal point

String - A sequence of characters

Boolean - Value that is True or False

Basic Operations

Operations:

Exponent: **, Multiplication: *, Division: /, Addition: +,

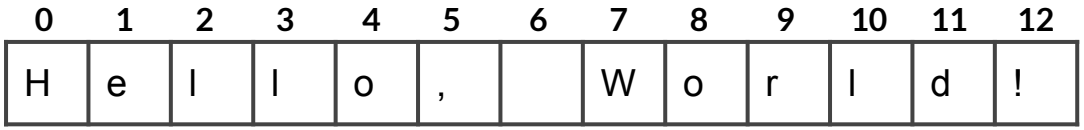
Subtraction: -, Floor Division: //, Modulo: %

Equal to: ==, Greater than: >, Greater than or equal to: >=,

Less than: <, Less than or equal to: <=

And, **or**, **not**

String Functions



len(string) - Length of string

str(), int(), float() - Convert to string, int, or float

string[index] - Gives a character at that index. Indices start from 0.

string[start:stop:step] - Slices string from index start (inclusive) to index stop (exclusive) by step

string.find(character) - Returns index of left most instance of named character in string, returns -1 if not found.

string.upper(), string.lower(), string.capitalize() - Changes string to uppercase and lowercase, and capitalizes first character.

ord(character), chr(int) - Returns **ASCII** number of character, and returns character at that **ASCII** number

If - elif - else

If, else, and **elif** are keywords

Lines must be indented

If - Condition is true

Elif - Previous conditions are false and current condition is true

Else - All previous conditions are false

how_are_you.py

```
1  feeling = input('How are you today? ')
2  if feeling == 'Good':
3    print("That's good to hear!")
4  elif feeling == 'Bad':
5    print("I hope you feel better soon.")
6  elif feeling == 'Okay':
7    print("Thank you for sharing!")
8  else:
9    print('Please say if you feel good, bad, or okay.')
```

While loop

While is a keyword

Condition must be true

Lines are indented

Code inside must affect condition

say_my_name_while.py

```
1  name = input('What is your name? ')
2  times = int(input('How many times should I say your name? '))
3  count = 1
4  while count <= times:
5      print(str(count) + ') Hello, ' + name + '!')
6      count += 1
```

For loop

For is a keyword

Lines must be indented

Use range() function

Easier than while loop in most cases

count_character.py

```
1  user_string = input('Please type any string: ')
2  user_char = input('What character would you like to count? ')
3
4  print('Your string is '+str(len(user_string))+' characters long.')
5  char_count = 0
6  for char in user_string:
7      if char == user_char:
8          char_count += 1
9  print(user_char+' appeared '+str(char_count)+' times in your string.')
```

Timer program

timer.py

```
1   from time import sleep
2
3   seconds = int(input('Enter time in seconds: '))
4   print(seconds)
5   for second in range(1, seconds + 1):
6     sleep(1)
7     print(seconds - second)
8     if seconds - second == 0:
9       print('TIME UP')
```

Resources

- Workshop materials and code available at https://avnithv.github.io/
- Sign up on Repl to code using online tools (no download/installation needed)
- Sign up on Hackerrank to practice Python coding using online tools (no download/installation needed)