Intro to Python

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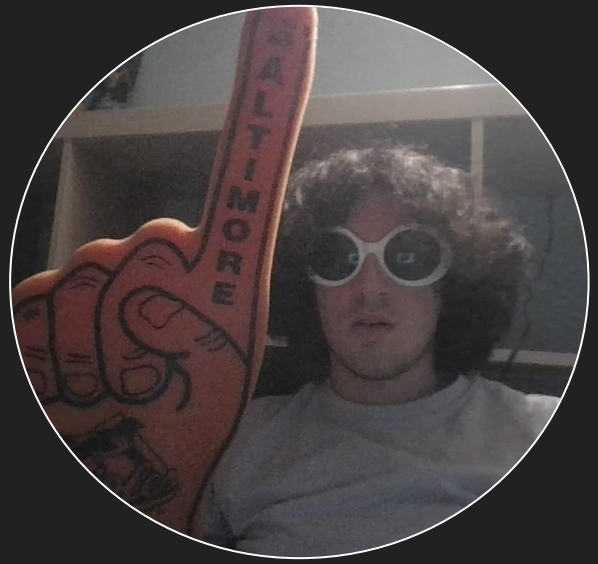
Who□ My name is Samuel



I am a student at Beaverton High School and this will be my 2nd year with Beavertronics. I'm entering my senior year and am a member of the programming subteam.

Python: What? How?

Building Blocks

Variables/Attributes

```
var = “I contain information”
```

Functions/Methods

```
def complain():
    do something here
```

Classes/Objects

```
class Frog():
    contains attributes and methods
```

Example Use

Make Variables and Define Functions

```
fave_pie = “Key Lime Pie”

def ask_for_pie():
        print(“Give me some “, fave_pie)
```

Call your Function

```
ask_for_pie()
```

See results in the terminal

```
“Give me some Key Lime Pie”
```

More Python Tools

For:

```
for < individual> in <set>:
    do_something
```

While:

```
while <condition>:
    do_something
```

If/Else:

```
if <condition>:
    do_something

else:
    do_something_else
```

Object Oriented Programming

OOP - Structure

```
import Class
obj = ['foo', 'bar']
new_class = Class(obj)
new_class.instance_method()
```

```
class Class():
    def __init__(self, attr):
        self.obj = attr
        # objects belonging to a class are attributes of that class
        self.object = ['list', 'with', 'strings', 'inside']
        self.object = 'string'
        self.object = {'key' : 'value'} # dict
    def instance_method(self):
        print("{} was passed in to this class".format(self.obj) +\
            " when it was made into an object!")
```

OOP - Example

```
class Samuel():
    def __init__(self, punchline):
        self.joke = punchline
        self.weakness = [none]
        self.hobby = 'moonlit walks on the beach'
        self.stats = {'str' : '10' , 'dex' : '10' , 'con' : '10' , 'int' : '10' , 'wis' : '10' , 'cha' : '10'}
    def tell_hilarious_joke(self):
        print("Why did the chicken cross the road? {}!".format(self.joke))
```

```
import Samuel
punchline = "To get to the other side"
samuel_instance = Samuel(punchline)
samuel_instance.tell_hilarious_joke
```

OOP - Inheritance

Example:

```
class Amphibian():
    class_description_here

class Frog(Amphibian):
    class_description_here
    inherits from Amphibian class
```

Robotics Use:

```
class Subsystem():
    class_description_here

class Shooter(Subsystem):
    class_description_here
    inherits from Subsystem class
```

Libraries

What are Libraries:

- Libraries are essentially large collections of premade programs
- You can import them into your own programs, allowing you to:
  - → Use premade resources
  - → Be more efficient with what you need to program yourself
  - → Learn from what others have made
- Robot.py is what we use for premade robot integration

Okay. Now what?

Practice (and don't be afraid to ask questions)

There are many online resources for learning programming languages, such as https://www.codecademy.com/, https://www.khanacademy.org/, and more. The internet also possesses great forums to find answers to your questions like https://stackoverflow.com/ or https://www.chiefdelphi.com/. The best way to learn is to practice!

Questions?