

With **Loops**, we can repeat commands multiple times. If I want to add 4 to a number 7 times, I might use a **for loop** and the **range()** function in Python:

```
num = 0
for z in range(7):
    num = num + 4
```

Lists hold items of the same data type. Each value in the array corresponds to a number called an index corresponds to an "index". In the following example, "i" is some real number

i - 1	i	i + 1
5	17	1

Example:

```
def list_example():
    myList = [ h, e, l, l, o ]
    for letter in myList:
        print(letter)
```

What does the function print? The variables "letter" and "myList" could be named any other name (as long as the name is not a reserved word).

Fun fact: Programmers start counting at 0!

Sometimes, we want to check the "truth" of a statement. Humans are actually smarter than computers and need to include **conditional statements** to help the computer react to different conditions. This is achieved using an **if statement**, which checks if something is true.

Another type of loop is called a **while loop**. This type of loop also uses a truth statement, or simply a **boolean** (booleans are "true" and "false").

If statements enable you to run different commands based on different inputs (similar to a *piecewise function* in mathematics). The following is an example of an if/elif/else statement, where if and elif correspond to specific conditions and else is used none of the conditions are satisfied.

```
def conditional_function (num):
    if (num <= . 0):
        print ("too low!")
    elif (num > 2):
        print("too high!")
    else:
        print("just right!")
```

Which numbers are "just right" according to this function?

Note: As a computer programmer, an important skill for you to learn is proper **style**. For some practice to be considered "good style", it just has to be a good habit that makes your code more readable. Readable code is helpful for teachers in grading your programs. During your career in computer science, you will often have to work with your peers on projects; it's important for any project that they are able to read your code—practice good style!

In the parenthesis after a function definition, there is sometimes a variable. You can see an example of this on the page where we discuss conditional loops. This variable is called a parameter, and gets "passed" to the function every time the function is called. This value can even be a different item each time the function is called. Parameters will come in handy!

In the English language, letters form words, which compose sentences. In computer programming languages, chars (short for characters) are the building blocks of **strings**. In other words, strings are just sequences of chars; strings can be sentences, words, or letters. In Python, we use `str()` to convert numbers and other data types to strings. Check out this example:

```
def string_example():
    first_string = "my "
    second_string = "favorite
    color is"
    third_string = "blue "
    final_string = first_string +
        + str(2)
        + "nd "
        + second_string
        + third_string
    return final_string
```

What does this function return?

BE CAREFUL when you use while loops. Sometimes, your program can get stuck in an infinite loop; This is when a program never ends. Here's an example:

```
while (3 < 2):
    a = 4
    b = 2
```

Since $(3 < 2)$ is always a true statement, this loop will continue to run forever! Try to avoid this situation, if you can.

A **compiler** translates the code that we write in Python into something called **machine code**, that our computers can

Please attempt to write these programs this week:

1. Write a function that incorporates booleans and a while loop, but is under 10 lines.
2. Write a function that prints all prime numbers less than 100, without listing them.
3. Write a function that finds the palindrome of an inputted string.

Answer the following questions:

1. Name are three different ways you can iterate through a list?
2. Define: "Machine Code".

Artifact

My artifact is a zine.

Audience

The target audience is high school students from any sort of background taking an introductory CS course.

Sample Scenario

This might be used as a homework reading assignment, similar to a worksheet that is to be completed outside of school.

Learning Outcomes

- Students are introduced to basic, but very important topics.
- Students add to their list of study terms for their building list of flashcards.
- Students are beginning to be able to read code and understand what it does.

Prior Knowledge Expected

- Students should have the proper software installed so that they are able to write and run code.
- Students should have seen Python code and even coded it in previous lessons.
- Students should have basic mathematical capability

Other Information

- None.