**Arrays Part II - Strings**

In the previous lesson, we learned that a **string** is an *array of letters*. Each letter is an element of the array. What will this print?

country = "Pakistan"

print (country [2])

As you know, you can use the **len()** function with a string:

country = "Pakistan"

print (len(country)) # how many letters?

And you can loop through each letter:

country = "Bangladesh"

for letter in country:

print (letter)

Remember that the computer does not know what a “letter” is. The program is given the string “Bangladesh” and told to go through every element of the string. You can use any variable name instead of letter and it will still operate the same way.

You can do the same using the index:

country = "Bangladesh"

for i in range(6): # count from 0 to 5

print (country[i]) # print each element (letter)

This is a little different because we are getting the loop to go through the numbers 0 to 5, and printing the letter at each count. In this case the variable i is not a letter at all, but a number we call an **index**.

The first example is the preferred method as it is most simple. The second example (using an index) is sometimes necessary when you need to keep track of *which* letter you are on. For example if you wanted to change the third letter, or omit the 5th letter, you would need to use an index as in the second example.

The second example only gets through the first 6 letters. Use the len() function if you want to print all the letters:

country = "Bangladesh"

for i in range(**len(country)**): # count through all the letters

print (country[i]) # print each element (letter)

**The split() Function**

If a string is a sentence, a useful thing is to be able to split it into separate words. The **split()** function can do this:

sentence = "The cat jumped over the fox."

words = sentence.split() # split into array of words

print (words) # What does this do?

print (len(words)) # What does this do?

The computer doesn’t know English or what a word is, so how does it work? The split() function looks for spaces in the sentence and puts the words it finds (between the spaces) into an array. In the above example, the array is called “words”.

So, in this example:

* sentence is an array of letters. For example, sentence[0] is “T”.
* words is an array of words. For example, words[0] is “The”.
* sentence and words are variables. They could have been given any name, but these names make sense.

We can use this to pick out words in a sentence:

sentence = "The cat jumped over the fox."

words = sentence.split() # split into array of words

print (words**[2]**) # third word

print (words**[-1]**) # What does this do?

The split() function looks for spaces by default, but you could also get it to search for other characters such as the comma in a shopping list:

groceries = "milk, bread, juice, cereal"

items = groceries.split(",") # looks for comma

print (items)

**Summary:**

A sentence can be split into words:

words = sentence.split()

The words can then be looked at one at a time. This prints the 3rd word:

print (words[2])

You can print all the words using an indexed for loop:

for i in range(len(words)):

print(words[i])

Or you can use a non-indexed loop:

words = sentence.split()

for word in words:

print(word)

**Exercise**

1. Ask the user for a sentence. Print each word in the sentence individually.

Enter a sentence: My feet hurt

My

feet

hurt

1. Do question #1 again, but print the words out using a different method in your for loop. Hint: Indexing vs non-indexing.
2. Create a program that finds the third letter in a word:

Enter a word: Complicated

m is the third letter in Complicated.

1. Use the upper() function to capitalize the first letter of a word, like so:

Enter a word: house

House is a nice word.

1. Ask the user for a sentence. Determine the number of words in that sentence that have 3 letters or less.