**Arrays Part II - Searching Through an Array**

As we know by now, an array is a list of objects. These objects are indexed (numbered) starting from zero. A common problem is to identify where an object lies in a list. Is it the first element? Is it the fifth element? The last element?

Consider a periodic table of elements:

elements = ["Hydrogen", "Helium","Lithium","Beryllium","Boron","Carbon","Nitrogen"]

This list is not complete, but we get the idea.

How can we associate each element with the position in this list? Consider this code:

elements = ["Hydrogen", "Helium","Lithium","Beryllium","Boron","Carbon","Nitrogen"]

print(elements[1])

print(elements[-1])

What will this print?

The elements in this list are ***indexed*** - numbered from zero and up. The index is a way to tell the position of the element.

The second line, although it doesn’t make sense at first, means “print one element from the end”. This is mildly useful if you want to go backwards from the last element.

Now suppose we want to ***search*** for a particular element.

elements = ["Hydrogen", "Helium","Lithium","Beryllium","Boron","Carbon","Nitrogen"]

search = input("Enter an element to find: ")

if search == elements[0]:

print("Hydrogen")

if search == elements[1]:

print("Helium")

if search == elements[2]:

print("Lithium")

# repeat for other elements

There is a pattern. We are going through each element in the list. This is perfect for a loop:

elements = ["Hydrogen", "Helium","Lithium","Beryllium","Boron","Carbon","Nitrogen"]

search = input("Enter an element to find: ")

for i in range(7): # repeat 7 times

if search == elements[i]: # Is this the right element ?

print(elements[i], “is in the list”) # print it.

This is a typical **search** **loop**. A search loop goes through a list, searching for a particular element. This is a common function in programming.

**Exercise**

1. Create an array called *activities* which contains 5 activities of your choice. Create a second array called *adjectives* filled with 4 adjectives. Create a loop that prints ten random sentences:

Hockey is boring.

Knitting is fun.

Sleeping is awesome.

etc.

1. Create two arrays: **province** contains 12 provinces and **capital** contains 12 capitals. Make sure your provinces array matches your capital array. Have your program pick a random province and ask the user to name the capital of that province. If the user gets it wrong, give them the correct answer. Have the program loop 5 times and keep a final score. Some additions:

* Keep an array of previously asked questions to make sure you don't ask the same answer twice.
* Use the upper() or lower() function to allow the user to enter different capitalizations.

What is the capital of Ontario? TORonTO

Correct!

What is the capital of New Brunswick? New Delhi

I'm sorry, the correct answer is Fredericton.

Your final score is 3 out of 5 questions. You need to do your homework.