

Activity 3-1

April 5, 2012

Task 1: Create a List of Lists

Write a function called `task1()` that returns a list that looks like `[[0,1,2], [1,2,3], [2,3,4], [3,4,5], [4,5,6]]` using **two** for loops. If you want to try this without help, go for it! Otherwise, here are some intermediate steps that will lead you to the correct list.

1. First, write `task1()` so it returns the list `[0,1,2,3,4]` using a for loop. Start with an empty list (`[]`) and create the list using concatenation (with a `+`). The function `range(0,5)` might be useful.
2. Modify the function to return the list `[[0], [1], [2], [3], [4]]`. Enter this into the shell:

```
1 myList = task1()
2 myList[2]
```

What does `myList[2]` return? What type is it? How would you index into `myList` to get the integer 2?

3. Modify the function to return the list `[[0,0,0], [1,1,1], [2,2,2], [3,3,3], [4,4,4]]`. To do this, use an additional for loop *inside* the first for loop with the function `range(0,2)`. Use a new variable (I'll call it `tmpList`) that first builds the list `[0,0,0]`, and *then* add `tmpList` to the empty list. In the second iteration `tmpList` will be `[1,1,1]`, and so on.
4. Figure out how to return the list `[[0,1,2], [1,2,3], [2,3,4], [3,4,5], [4,5,6]]`. You have two indices (from the two for loops) that you can use. Enter the lines from #2 in the shell. Now what does `myList[2]` return? Try some other indexing until you are familiar with how to handle a list of lists.
5. We're done! As a final test, use indexing to change `myList` from `[[0,1,2], [1,2,3], [2,3,4], [3,4,5], [4,5,6]]` to `[[0,1,2], [1,2,3], [2,3,4], [3, 'a', 5], [4,5,6]]`.

Task 2: Write the List of Lists to a File

Write a function called `writeTask1(outfile)` that writes the list from Task 1 to a file called `outfile`. Start with this basic code:

```

1 def writeTask1(outfile):
2     myList = task1()
3     # write myList to outfile here.
4
5     return

```

1. First, let's just print something random to a file to see how writing to a file works. Write the string `'0,1,2\n'` to the output file specified as an input. These functions are useful:

<code>myFile = open('outfile.txt', 'w')</code>	Opens 'outfile.txt' for writing.
<code>myFile.write('write me.\n')</code>	Writes 'write me.\n' to the file.
<code>myFile.close()</code>	Closes the file.

Warning: When you have the output file *open*, you cannot write to it. Be sure to close the file before running your program.

2. Modify the function to write the first element of `myList` (which is indexed at `myList[0][0]`) followed by a newline (`'\n'`).
3. Write `myList` separated by commas, so the output file looks like this:

```

0,1,2
1,2,3
2,3,4
3,4,5
4,5,6

```

It might be easier to start by writing a file that looks like this:

```

,0,1,2
,1,2,3
...

```

And then figure out how to remove the leading commas.