

A201/A597 Introduction to Programming I

Second Summer 2008



Lab Five: Wednesday May 14, 2008 (BH308)

We will keep the lab notes extremely simple this time around.

Recall the last problems in the 05/07 lab assignment? You used `.replace(...)`. It would be a good exercise to redo them by using `for` loops instead of string methods. Here's the lab assignment for today: write a program that places the string "egg" in front of every vowel in a string given by the user. This is how your program might behave:

```
>>>
Gimme: Hi.
Heggi.

>>>
Gimme: Convoluted
Ceggonveggoleggutegged

>>>
Gimme: I am here.
I eggam heggeregge.

>>>
Gimme: This is a fun program.
Theggis eggis egga feggun preggogreggam.

>>>
Gimme: Thank you.
Theggank yeggoeggu.

>>>
```

Notice that the `in` operator in the `for` loop has two uses when it comes to sequences: first, the use that we have seen already, it helps for with the mapping; second, by itself, it helps determine whether an element belongs to a sequence or not. Here's an example:

```
>>> a = "nothing"
>>> "h" in a
1
>>> if "h" in a:
    print "Yes"
else:
    print "No"

Yes
>>>
```

So lab assignment for today is just one program (eggy-peggy, above) but feel free to experiment with strings and lists, indexing/slicing them and maybe even mutating them.

Another thing you could do in today's lab would be to work out a flowchart for Homework Three (posted, attached). Just a flowchart, on paper, not a program. You can use the same approach for Homework Two (which is due tomorrow night, by the way).



Homework Three

First, write an algorithm to settle the following question: A bank account starts out with \$10,000. Interest is compounded at the end of every month at 6 percent per year (0.5 percent per month). At the beginning of every month, \$500 is withdrawn to meet college expenses after the interest has been credited. After how many years is the account depleted?

Now suppose the numbers (\$10,000, 6 percent, \$500) were user-selectable. Are there values for which the algorithm you developed would not terminate? If so, make sure it always terminates. Here's how my program works:

```
>>>
Welcome to the financial calculator.
What's your initial balance? 10000
What's the yearly interest? 6
How much do you plan to withdraw monthly? 500
The account will last 1 year(s) and 9 month(s).
Ending balance will be: 62.2 dollars.

>>>
Welcome to the financial calculator.
What's your initial balance? 10000
What's the yearly interest? 6
How much do you plan to withdraw monthly? 100
The account will last 11 year(s) and 6 month(s).
Ending balance will be: 97.09 dollars.

>>>
Welcome to the financial calculator.
What's your initial balance? 10000
What's the yearly interest? 6
How much do you plan to withdraw monthly? 10
This will last forever.

>>>
Welcome to the financial calculator.
What's your initial balance? 10000
What's the yearly interest? 6
How much do you plan to withdraw monthly? 50
The account will last 525 year(s) and 1 month(s).
Ending balance will be: 48.1 dollars.
```

Note especially how my program detects when the funds can last forever.