

Algorithmic Approaches for Biological Data, Lecture #5

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More on Loops

- Indefinite Loops



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- Indefinite Loops
- Looping Through Strings

Review: for-loops

Standard form:

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for x in <list>:  
    command1  
    command2  
    ...  
    commandN
```

Roughly, the for loop:

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range(stop)  
range(start,stop)  
range(start, stop, step)
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Roughly, the for loop:

- 1 assigns next value of list to x ,
- 2 does the body statements, and
- 3 then if there's still list items goes back to #1; else ends loop.

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- Form of **indefinite** loops.
- Example: checking input for errors:

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num = input('Please enter a positive number: ')
while num <=0:
    print "Entered negative number"
    num = input('Please enter a positive number: ')
print "Thank you! Number entered is", num
```

while loops

Roughly, the while loop:

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while <test>:  
    command1  
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Roughly, the while loop:

- 1 checks the test condition
- 2 if true, does body statements & goes back to #1
- 3 if false, leaves loop
else ends loop.

More examples

- PythonTutor example

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while <test>:  
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- PythonTutor example
- Newton's Method in ThinkCS

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- ▶ If n is 10, start with $\text{approx} = 10/2 = 5$

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- The program stops if the turtle goes farther than $x = 100$ or $y = 100$, and similarly, in the negative direction $x = -100$ or $y = -100$.
- That is, the turtle continues walking only when:
 $-100 < x < 100$ and $-100 < y < 100$

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- That is, the turtle continues walking only when:
 $-100 < x < 100$ and $-100 < y < 100$
- Some useful turtle methods are:
`turtle.xcor()` and `turtle.ycor()`.

Looping Through Strings (preview)



What do these do? (PythonTutor example)

- ```
for ch in "Teddy Roosevelt":
 print ch
```
- ```
name = raw_input('Please enter your name: ')  
for c in name:  
    print c, "!",
```

Recap



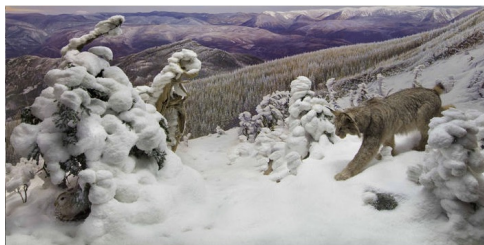
- Lab today at 3pm.

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- Challenges available at rosalind.info
(use emailed link to access course page).