CS21: INTRODUCTION TO COMPUTER SCIENCE

Prof. Mathieson
Fall 2018
Swarthmore College
Outline Sept 14:

- For loop recap
- Random module
- Accumulator pattern
  - sum_loop.py program
  - rand_loop.py program
  - user_loop.py program

Notes
- Lab 1 due Saturday night
- Office hours TODAY (3-5pm in 249)
- Ninja session TONIGHT (7-9pm in 256)
- Quiz 1: next Friday (9/21), let me know about conflicts
- Practice problems in the practice directory (try on paper first)
- Email me if you will be absent from class

Sit at a new computer!

More practice problems:
- stretch.py
- telephone.py
Participation

- Attending class
- Participating in class (asking/answering questions)
- Attending ninja sessions & office hours *
- Posting on Piazza (both asking and answering)

Grades will be weighted as follows:
35% Lab assignments
30% Quizzes
30% Final Exam
5% Class Participation
Informal quiz: discuss with a partner

1) Fix the errors in the code below, by Student X:

A

```python
# goal: print "hello!" 3 times
x = 3.0
for i in range(x):
    print("hello!")
```

B

```python
# goal: print 1,2,3,4,5 on separate lines
for i in range(5):
    print(i)
```

C

```python
# goal: print first ten even numbers
for i in range(10):
    print(x*2)
```

D

```python
# goal: print last character of string
day = "Friday"
n = len(day)
print(day[n])
```

2) When I say “for i in range(4)”, does this define a new variable? If so, what value(s) does it take on?

3) Bonus: How could I count backward from n (even) to 0 by 2’s?
Informal quiz: discuss with a partner

1) Fix the errors in the code below, by Student X:

A
# goal: print "hello!" 3 times
x = 3 (must be an int)
for i in range(x):
    print("hello!")

B
# goal: print 1,2,3,4,5 on separate lines
for i in range(5):
    print(i)

C
# goal: print first ten even numbers
for i in range(10):
    print(x*2)

D
# goal: print last character of string
day = "Friday"
n = len(day)
print(day[n])

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3) Bonus: How could I count backward from n (even) to 0 by 2’s?
Informal quiz: discuss with a partner

1) Fix the errors in the code below, by Student X:

A

```python
# goal: print "hello!" 3 times
x = "0 3" (must be an int)
for i in range(x):
    print("hello!")
```

B

```python
# goal: print 1,2,3,4,5 on separate lines
for i in range(5):
    print(i+1) (range starts from 0)
```

C

```python
# goal: print first ten even numbers
for i in range(10):
    print(x*2)
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D

```python
# goal: print last character of string
day = "Friday"
n = len(day)
print(day[n])
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x = 3  # must be an int
for i in range(x):
    print("hello!")
```

B
```python
# goal: print 1,2,3,4,5 on separate lines
for i in range(5):
    print(x)  # i+1  # range starts from 0
```

C
```python
# goal: print first ten even numbers
for i in range(10):
    print(i*2)  # i*2  # (x is not defined)
```

D
```python
# goal: print last character of string
day = "Friday"
n = len(day)
print(day[n])
```

2) When I say “for i in range(4)”, does this define a new variable? If so, what value(s) does it take on?

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# goal: print first ten even numbers
for i in range(10):
    print(i*2)  # (x is not defined)
```

D

```python
# goal: print last character of string
day = "Friday"
n = len(day)
print(day[n-1])  # (day[])
```

• 2) When I say “for i in range(4)”, does this define a new variable? If so, what value(s) does it take on?

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print(day[n-1])
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2) When I say “for i in range(4)”, does this define a new variable? If so, what value(s) does it take on?

Yes, i is implicitly defined as a new variable, and takes on the values 0,1,2,3

3) Bonus: How could I count backward from n (even) to 0 by 2’s?
Informal quiz: discuss with a partner

1) Fix the errors in the code below, by Student X:

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for i in range(x):
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# goal: print 1,2,3,4,5 on separate lines
for i in range(5):
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for i in range(10):
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```python
# goal: print last character of string
day = "Friday"
for i in range(len(day)):
    n = len(day)
    print(day[n-1])
```

2) When I say “for i in range(4)”, does this define a new variable? If so, what value(s) does it take on?

Yes, `i` is implicitly defined as a new variable, and takes on the values 0,1,2,3.

3) Bonus: How could I count backward from `n` (even) to 0 by 2’s?

Exercise! (make a new file in practice directory: “atom even_loop.py”)
Recap last time
```python
def main():

    # ask the user for an integer
    n = int(input("Enter an integer: "))

    # run the for loop n times
    for i in range(n):
        # for each pass through the loop, use string repetition
        print("*"*n)

main()
```
def main():
    # ask the user for an integer
    n = int(input("Enter an integer: "))

    # run the for loop n times
    for i in range(n):
        # for each pass through the loop, use string repetition
        print("*"*n)

main()

In this case the code “inside” the for loop (indented) did not depend on the loop index variable i, but often it will
**blastoff.py (example of written work)**

<table>
<thead>
<tr>
<th>i</th>
<th>want</th>
<th>formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>5</td>
<td>5 - 0</td>
</tr>
<tr>
<td>1</td>
<td>4</td>
<td>5 - 1</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>5 - 2</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>5 - 3</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>5 - 4</td>
</tr>
</tbody>
</table>

```python
n = 5

for i in range(n):
    print(i)
```

(0) have

"in the string" "don't forget"
Accumulator pattern

+ random module demo
sum_loop.py (example of written work)

\[ n = 4 \]

\[ S = 0 + 1 + 2 + 3 = 6 \]

\[ \frac{S}{3} = \frac{6}{3} = 2 \]

\[ S = 8 + 1 \Rightarrow 1 \]

\[ S = 8 + 3 \Rightarrow 3 \]

\[ S = 8 + 3 \Rightarrow 6 \]
Practice accumulator pattern

• Working with a partner, complete the **rand_loop.py** code
• Move on to the **user_loop.py** program

• More accumulator practice (with strings) in the practice directory if you finish early
  • **stretch.py**
    
    ```
    python3 stretch.py
    Enter a string: weekend
    Stretch string: wweekkeenndd
    ```
  
  • **telephone.py**
    
    ```
    python3 telephone.py
    Enter a sentence: How was your weekend?
    Transmitted sentence: Hwwsyu ekn?
    ```