On your way in...

Pick-up:
1. Homework 2, due Monday
2. POGIL 8: While Loops
3. POGIL 9&10: For Loops + Nested Loops
Have you found the TA + Help Hours?

Computer Science 134C: Introduction to Computer Science — Spring 2019
Instructors: Shikha Singh (shikha@cs.williams.edu) and Iris Howley (iris@cs.williams.edu)

Student Help Hours: Shikha (TBL309b): Mon. 2:30-4:00p, Wed. 12:00-2:00p (CS Common Room), Thu. 1-2p (CS Common Room)
Iris (TCL308): Wed. 12:00-1:00p, Thurs. 10:00a-12:00p
Lida (TCL205) 1:30-3pm

Assistants: Harun Curuk, Diego Esparza, Nathan Thimothe,
Maria Chapman, Amelia Chen, Caleb Dittmar, Hugo Hua, Brian Kamau, Sarah Lyell, Yash Mangal,
Rachel Nguyen, Minh Phan, Mira Sneirson, Jules Walzer-Goldfeld, Emma Wuerth

TA Hours: Sun-Thu 7-9:30p

Web resources: http://www.cs.williams.edu/~cs134/
Technical Support: Lida Doret (lida@cs.williams.edu), TCL 205 & Mary Bailey (mary@cs.williams.edu), TCL 312.
Lecture: SSL30A, Monday, Wednesday, and Friday at 8:00 a.m (Shikha) & 11:00 a.m (Iris).
Lab Times: Mon 1-2:30pm (Iris), 2:30-4pm (Iris), Tue 1-2:30pm (Shikha), 2:30-4pm (Shikha)
Lab Location: TCL 217a
CS Lab Code: 1-2-4-8-16 (remember visually, or think: $2^0, 2^1, 2^2, 2^3, 2^4$).

Student Help hours for TAs & Professors have begun!
Welcome to CS 134!

Introduction to Computer Science

Iris Howley

-Iteration-
If Statements & Booleans

- return x%2 == 0

Is equivalent to (and much better than):

- if x%2 == 0:
  - return True
- else:
  - return False
TODAY’S LESSON

Iterating over sequences of objects

(Great for when you have large quantities of items.)
POGIL – Activity 8

• Look at Python Activity 8, Questions 1-5
• Find a partner and talk through the questions together
POGIL – Activity 8, Question 1

```python
# This program prints a person's name 20 times
name = input("Enter your name: ")
x = 0
while (x < 20):
    print(name)
    x += 1
```

a. e. **Every loop structure requires three actions.** Identify the line of code in the Python program that corresponds to each of the three actions.

b. ▪ **Initialize a variable used in the test condition:**

c. ▪ **Include a test condition that causes the loop to end when the condition is false:**

d. ▪ **Within the loop body, update the variable used in the test condition:**
Enter and execute the following code. Beside each line of code explain what the code does.

```python
# This program prints numbers from 1 to the
# value entered by the user
number = int(input("Enter a number: "))

x = 1

while(x <= number):
    if(x % 10 == 0):
        print(x)
    else:
        print(x, end=" ")

x = x + 1
```
3. The following code should print the numbers from 1 to 10, but it does not print anything. Correct the problem.

```python
number = 12
while number <= 10:
    print(number)
    number = number + 1
```

4. Examine the following code:

```python
number = 0
while number <= 10:
    print(number)
    number = number - 1
```

a. What will the output be?

b. Does the program end? Why or why not?
5. Examine the following code:
   ```python
   number = 1
   while number <= 10:
       if number % 2 == 0:
           print(number, end= "  ")
       number = number + 1
   ```

a. State the output.
   ______________________________________________________________

b. What caused the output to display on one line?
   ______________________________________________________________

c. What control structures are used in this code?
   ____________________________________________________________ and _________________________________________________
User-controlled Loops
num = int(input("Enter an even number: "))

while (num%2 != 0):
    num = int(input("Odd! Enter an even number: "))

print("EVEN: ", num)
POGIL – Activity 9

• Look at Python Activity 9, Question 1
• Find a partner and talk through the questions together
For Loops (POGIL 9 Q1)

What does #1 do?

```python
#1
name = input("Enter name:")
x = 0
while (x<20):
    print(name)
x += 1
```

What does #2 do?

```python
#2
name = input("Enter name:")
for x in range(20):
    print(name)
```
For Loops (POGIL 9 Q1)

#1
name = input("Enter name:")
x = 0
while (x<20):
    print(name)
    x += 1

#2
name = input("Enter name:")
for x in range(20):
    print(name)

...will print "Iris" a total of 20x on 20 lines

...will ALSO print "Iris" a total of 20x on 20 lines
For Loops

What does #3 do?

#3

name = input("Enter name:")

for letter in name:
    print(letter + "\*")

#2

name = input("Enter name:")

for x in range(20):
    print(name)
For Loops (POGIL 9)
How does the range(..) function work?

• 2a
```python
>>> for x in range(5):
...    print(x, end=" ")
... 0 1 2 3 4 >>>
```

• 2b
```python
>>> for x in range(1, 5):
...    print(x, end=" ")
... 1 2 3 4 >>>
```

• 2c
```python
>>> for x in range(3, 20, 2):
...    print(x, end=" ")
... 3 5 7 9 11 13 15 17 19 >>>
```

• 2d
```python
>>> numIterations = 6
>>> for x in range(numIterations):
...    print(x, end=" ")
... 0 1 2 3 4 5 >>>
```
For Loops (POGIL 9 Q4)

```python
>>> for x in [3,6,9,12,15,18]:
...     print(x, end=" ")
...
3 6 9 12 15 18
```

How to rewrite with `range(..)` function?

Why use `range(..)` when we could just use numbers?
Range
```python
-> python3
>>> range(20)
range(0, 20)
>>> list(range(0,20))
[0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19]
>>> range(0)
range(0, 0)
>>> list(range(0))
[]
>>> type(range(20))
<class 'range'>
```
WE ITERATE OVER SEQUENCES OF OBJECTS.

A RANGE IS A SEQUENCE OF INTS
A STRING IS A SEQUENCE OF CHARACTERS
A LIST IS A SEQUENCE OF OBJECTS
questions?
Leftover Slides