# CS21: INTRODUCTION TO COMPUTER SCIENCE

Prof. Mathieson

Fall 2017

Swarthmore College

# For loop warmup to start now (with a partner)

1) update21
2) cd cs21/inclass/week02/
3) python3 even_loop.py
4) atom even_loop.py
5) modify the program as described in the header, testing after each step

# even_loop.py example solution

```
"""
Iteratively modify the code below to create different for loops.

1) Let the user select the number of loop iterations.
2) Instead of 0,1,2,3..., print out even numbers: 0,2,4,6...
3) Let the user choose the multiplier too. So if the user chooses 6, print out
   0,6,12,18...

Author: Sara Mathieson
Date: 9/15/17
"""

def main():

    num_iter = int(input("Enter the number of loop iterations: "))
    mult = int(input("Enter the multiplier: "))
    for i in range(num_iter):
        print(i*mult)

main()
```

# Outline Sept 15:

Sit somewhere new!

- For loop practice and recap last time
- Accumulator pattern
  - len_loop.py program
  - sum_loop.py program

Notes

- **Lab 1** due **Saturday** night
- **Office hours TODAY** (3-5pm in 260)
- **Ninja session TONIGHT** (7-9pm in 256)
- **Quiz 1**: next Friday (9/22), let me know about conflicts
- **Practice problems** in the practice directory (try on paper first)

# Recap last time

# Two ways of looping over a list

```
miles_lst = [4, 10, 7, 0, 2, 1, 0]

# 1) loop over the elements directly
for miles in miles_lst:
    print(miles)

# 2) loop over the indices and use indexing
for i in range(len(miles_lst)):
    print(miles_lst[i])

# the second way might look more complicated,
# but if we ever want to print the index too,
# this way is more convenient
```

# miles_loop.py example solution

```
"""
Use a for loop to print out information about weekly mileage. Example output:

On day 0 you ran 4 miles
On day 1 you ran 10 miles
On day 2 you ran 7 miles
On day 3 you ran 0 miles
On day 4 you ran 2 miles
On day 5 you ran 1 miles
On day 6 you ran 0 miles

Author: Sara Mathieson
Date: 9/13/17
"""

def main():
    miles_lst = [4, 10, 7, 0, 2, 1, 0]
    num_days = len(miles_lst)
    for i in range(num_days):
        print("On day", i, "you ran", miles_lst[i])

main()
```

# pretty_print_all.py example solution

```
# Use a for-loop to pretty print all names in Section 1.
# Author: Sara Mathieson
# Date: 9/12/17

name_lst = ["Amaechi","Sajal","Matt","Youssef","David","Ian","Brandon","Andrew",
            "Allan","Sagnik","Nick","Rutger","Adi","Austin","Maddie","Mikey",
            "Peem","Shani","Patrick","Ari","Yusa","Sid","Miryam","Talia",
            "Sophia","Skylar","Anar","Kyle","Bayliss","Shirline","Eddie",
            "Claudia","Chris","Abby","Anya","Clarissa"]

def main():
    for name in name_lst:
        #name = input("What is your name? ")
        x = len(name)
        print((x+4)*'-')
        print('| ' + name + ' |')
        print((x+4)*'-')

main()
```

# Accumulator pattern

# Accumulator pattern

- General format:

```
# set up a variable you want to iteratively modify
variable = <initial value>

# loop over a sequence
for <item> in <seq>:
    # modify variable using item
    variable = variable + item

# print or output the final result
print(variable)
```

- First example: **len_loop.py**

# Practice accumulator pattern

- Working with a partner, complete the **sum_loop.py** code
- More accumulator practice (with strings) in the practice directory if you finish early
  - **stretch.py**
  - **star_string.py**

# Debugging loops

# Loop error #1

```
1
2
3  def main():
4      miles_lst = [4, 10, 7, 0, 2, 1, 0]
5
6      # 1) loop over the elements directly
7      for miles in miles_lst:
8          print(miles)
9
10     # 2) loop over the indices and use indexing
11     for i in range(miles_lst):
12         print(miles_lst[i])
13
14 main()
```

```
Traceback (most recent call last):
  File "loop_error.py", line 14, in <module>
    main()
  File "loop_error.py", line 11, in main
    for i in range(miles_lst):
TypeError: 'list' object cannot be interpreted as an integer
```

# Loop error #2

```
1
2
3   def main():
4       miles_lst = [4, 10, 7, 0, 2, 1, 0]
5
6       # 1) loop over the elements directly
7       for i in miles_lst:
8           print(miles_lst[i])
9
10      # 2) loop over the indices and use indexing
11      for i in range(miles_lst):
12          print(miles_lst[i])
13
14  main()
```

```
2
Traceback (most recent call last):
  File "loop_error.py", line 14, in <module>
    main()
  File "loop_error.py", line 8, in main
    print(miles_lst[i])
IndexError: list index out of range
```