CS21: INTRODUCTION TO COMPUTER SCIENCE

Prof. Mathieson
Fall 2017
Swarthmore College
Informal quiz: discuss with a new partner

Code draft from student X: mystery_error.py

```python
10    def mystery(lst):
11        s = 0
12        for i in lst:
13            s = s + lst[i]
14        print(s)
15
16    def main():
17        my_lst = [8, 3, 7, 2, 4, 9, 1, 19, 2, 17]
18
19        mystery(my_lst)
20        print("result1 is:", s)
21        print("result2 is:", s/len(my_lst))
22
23    main()
```

1) What is student X trying to do?
2) What errors do you notice in this program?
3) What style modifications would you make?
Outline Sept 27:

- Hand back Quiz 1
- Continue Functions (go over `factorial.py`)
- Scope and program execution
- Multi-function example: `min_max_range.py`

Notes

- Lab 3 due Saturday night
- Office hours Thursday 2-4pm (just this week!)
Quiz 1
Question 3: Loops

Loops

Output

```
x = 3
for i in range(x):
    print(i*x)
print("loops!")

name_lst = ["Sara","Jeff","Rich"]
for name in name_lst:
    print("initial:", name[0])

for ch in "code":
    print("----")
    print(ch+ch)
```
**Question 3: Loops**

<table>
<thead>
<tr>
<th>Loops</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>x = 3</code></td>
<td>0</td>
</tr>
<tr>
<td><code>for i in range(x):</code></td>
<td>3</td>
</tr>
<tr>
<td><code>print(i*x)</code></td>
<td>6</td>
</tr>
<tr>
<td><code>print(&quot;loops!&quot;)</code></td>
<td>loops!</td>
</tr>
</tbody>
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<tbody>
<tr>
<td><code>name_lst = [&quot;Sara&quot;,&quot;Jeff&quot;,&quot;Rich&quot;]</code></td>
<td></td>
</tr>
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<td></td>
</tr>
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Question 3: Loops

Loops

```python
x = 3
for i in range(x):
    print(i*x)
print("loops!")
```

Output

```
0
3
6
```

```
loops!
```

```
0
3
6
```

name_lst = ["Sara","Jeff","Rich"]
for name in name_lst:
    print("initial:", name[0])

for ch in "code":
    print("----")
    print(ch+ch)```
Question 3: Loops

Loops

```python
x = 3
for i in range(x):
    print(i*x)
print("loops!")
```

Output

```
0
3
6
loops!
```

```
initial: Sara
initial: Sara
initial: Sara
```

```
for ch in "code":
    print("----")
print(ch+ch)
```
Question 3: Loops

Loops

```
x = 3
for i in range(x):
    print(i*x)
print("loops!")
```

Output

```
0
3
6
loops!
```

```
name_lst = ["Sara","Jeff","Rich"]
for name in name_lst:
    print("initial:", name[0])
```

```
initial: S
initial: S
initial: S
```

```
for ch in "code":
    print("----")
print(ch+ch)
```

```
---
----
```
### Question 3: Loops

**Loops**

```python
x = 3
for i in range(x):
    print(i*x)
print("loops!")
```

**Output**

```
0
3
6
```

```python
name_lst = ["Sara","Jeff","Rich"]
for name in name_lst:
    print("initial:", name[0])
```

**Output**

```
initial: S
initial: J
initial: R
```

```python
for ch in "code":
    print("---")
print(ch+ch)
```

**Output**

```
cc
do
ee
codecode
codecode
codecode
codecode
codecode
codecode
codecode
codecode
```
Question 3: Loops

Loops

```python
x = 3
for i in range(x):
    print(i*x)
print("loops!")
```

Output

```
0
3
6
loops!
```

```python
name_lst = ["Sara","Jeff","Rich"]
for name in name_lst:
    print("initial:", name[0])
```

```
initial: S
initial: S
initial: R
```

```python
for ch in "code":
    print("---")
print(ch+ch)
```

```
---
---
---
---
```
Continue Functions
factorial.py example solution

```python
def factorial(n):
    """
    Given a non-negative integer n, return n! = n*(n-1)*(n-2)....3*2*1.
    """
    fac = 1  # set up an accumulator variable
    for i in range(n):
        fac = fac * (i+1)  # accumulator pattern
    return fac

def main():
    """
    In the main function, test the factorial function.
    """
    for n in range(10):
        # call the factorial function
        result = factorial(n)

        # print the result
        print("%d! = %d" % (n, result))

main()
```

Optional modification: range(1,n+1)
Scope and program execution

```python
def factorial(n):
    fac = 1  # set up an accumulator variable
    for i in range(n):
        fac = fac * (i+1)  # accumulator pattern
    return fac

def main():
    for n_test in range(10):
        # call the factorial function
        result = factorial(n_test)
        # print the result
        print("%d! = %d" % (n_test, result))

main()
```

Edit code | Live programming
Program for today

- cs21/inclass/week04/min_max_range.py

- Work with a partner

- Write the functions in order, testing each one

- No need to change main! Only to uncomment test cases
Function practice problems

- cs21/week04/lettercount.py
- cs21/practice/sum_list.py
- cs21/practice/series_function.py
- cs21/practice/fib_function.py