How do functions break up?

They stop calling each other!

Thank you Manav!

Source: https://twitter.com/catalinmpit/status/1442571813364568071?lang=en
Feedback on Practice Exam #2

- Very well done! 😊
  - Very few answers with repeated code

- Don’t forget header comment block and comments though!
In-Class Activity

• Our in-class activity #3 -> 1%
  • Write your answer to Q. ___ on the provided sheet of paper
  • Write your lastname, firstname and student number on the provided sheet of paper
  • At the end of today’s class, hand in your sheet of paper in the appropriate pile:
    • Pile 1 -> if your lastname start with a letter that is between ‘A’ and ‘L’
      • Pile 1 is on your left-hand side of the classroom
    • Pile 2 -> if your lastname start with a letter that is between ‘M’ to letter ‘Z’
      • Pile 2 is on your right-hand side of the classroom

Course grading scheme on our course website: Best 7 in-class exercises out of 10: 1% each, for a total of 7%
Part 1 - Theory and Understanding

Try to answer the questions 1st without using your computer, then confirm your answer using Python IDLE shell!
Function

Definition: Python code fragment that does _______ specific task.

Some functions take a________ when you call them.

Some functions r________ a value.

A function has a d______________ name.

Question 1

• Fill in the blanks:
# Strings and Lists

## 1. What would the variable `aSlice` contain once the following Python code fragment has executed?
```python
city = "Cranbrook"
aSlice = city[:5]
```

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.  &quot;Cranbr&quot;</td>
<td></td>
</tr>
<tr>
<td>B.  &quot;Cranb&quot;</td>
<td></td>
</tr>
<tr>
<td>C.  &quot;&quot;</td>
<td>(empty string)</td>
</tr>
<tr>
<td>D.  An error message</td>
<td></td>
</tr>
<tr>
<td>E.  None of the above</td>
<td></td>
</tr>
</tbody>
</table>

## 2. What would the variable `found` contain once the following Python code fragment has executed?
```python
city = "Cranbrook"
found = city.find("k")
```

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.  8</td>
<td></td>
</tr>
<tr>
<td>B.  -1</td>
<td></td>
</tr>
<tr>
<td>C.  9</td>
<td></td>
</tr>
<tr>
<td>D.  An error message</td>
<td></td>
</tr>
<tr>
<td>E.  None of the above</td>
<td></td>
</tr>
</tbody>
</table>

## 3. What does the following Python code fragment produce?
```python
numbers = list(range(10))
aSlice = numbers[8:2]
print(aSlice)
```

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.  [] (i.e., an empty list)</td>
<td></td>
</tr>
<tr>
<td>B.  [0, 2, 4, 6, 8]</td>
<td></td>
</tr>
<tr>
<td>C.  [0, 2, 4, 6]</td>
<td></td>
</tr>
<tr>
<td>D.  An error message</td>
<td></td>
</tr>
<tr>
<td>E.  None of the above</td>
<td></td>
</tr>
</tbody>
</table>

## 4. What does the following Python code fragment produce?
```python
grades = ['B', 'A', 'D']
print(grade[3])
```

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.  ['B', 'A', 'D']</td>
<td></td>
</tr>
<tr>
<td>B.  ['B', 'A']</td>
<td></td>
</tr>
<tr>
<td>C.  [] (i.e., an empty list)</td>
<td></td>
</tr>
<tr>
<td>D.  An error message</td>
<td></td>
</tr>
<tr>
<td>E.  None of the above</td>
<td></td>
</tr>
</tbody>
</table>
Question 5 - Are there functions in the real world?

1. Mom says to Louise “Please, can you go clean your bedroom?”
   - Specific task: Clean bedroom
   - Argument(s): None required
   - Returned value: None returned

2. Mom says to Louise “Here’s $5, please, can you go buy a bag of apples?”
   - Specific task: Buy a bag of apples
   - Argument(s): Mom gives $5 to Louise, so $5 is what Louise requires to perform the specific task of buying a bag of apples
   - Returned value: Louise returns a bag of apples (and perhaps some change 😊) to Mom
Question 5 - Are there functions in the real world?

3. Mom says to Louise “Please, can you find my cell phone?“
   - Specific task:
   - Argument(s):
   - Returned value:

4. Mom says to Louise “Please, can you put these bags on the kitchen counter?“
   - Specific task: Put bags on kitchen counter
   - Argument(s):
   - Returned value:

Following the examples on the pervious slide, can you complete this slide?

Ditto here!
Question 6

Let’s convert this `while` loop to a `for` loop?

```python
fruit = ["banana", "apple", "plum"]
index = 0
while index < len(fruit):
    print(fruit[index])
    index = index + 1
```
Question 7

What do the following statements produce?

a. "123456789" [2:8:3]  ->

b. "123456789" [2:8:-3]  ->

c. "123456789" [-2:-8:-3]  ->

d. "123456789" [-2:-8:3]  ->

e. "123456789" [8:2:3]  ->

f. "123456789" [8:2:-3]  ->

g. "123456789" [-8:-2:-3]  ->

h. "123456789" [-8:-2:3]  ->
Part 2 - Coding

Solve the following problems by writing a Python program on a piece of paper without using your computer!
Problem Statement:
Write an **Predicting Chatbot** that asks your name, your age and a number of years $x$ and predicts how old you will be in $x$ years, as shown in the **sample run** below:

```
Welcome to the Predicting Chatbot!
This Bot predicts how old you will be in x years.
Please, enter ...
    your name (letters): BillyBob
    your age (an integer): 27
    the number of years (x) for the prediction: 56

Dear BillyBob:
In 56 years, you will be 83 years old.
Bye!
```
Problem Statement: (cont’d)

You cannot assume the user will always enter a string for the name and an integer for the age and for \( x \) as illustrated in the following sample runs:

```
Welcome to the Predicting Chatbot!
This Bot predicts how old you will be in \( x \) years.
Please, enter ...
    your name (letters): Roy99
    your age (an integer): 34
You entered an invalid name: Roy99.
Bye!
```

```
Welcome to the Predicting Chatbot!
This Bot predicts how old you will be in \( x \) years.
Please, enter ...
    your name (letters): Roy
    your age (an integer): ten
You entered an invalid age: ten.
Bye!
```

```
Welcome to the Predicting Chatbot!
This Bot predicts how old you will be in \( x \) years.
Please, enter ...
    your name (letters): Roy
    your age (an integer): 10
    the number of years (\( x \)) for the prediction: lots
You entered an invalid number of years: lots.
Bye!
```
Problem Statement:
Write a Milk Survey Bot that asks the user whether s/he has tried almond, coconut, cow, goat, hemp, oat, rice, and/or soy milk.
Your Milk Survey Bot must then print the number of different kinds of milk the user has tried.

Here is a sample run:

How many different types of milk have you tried?
For example, have you tried ...
... almond milk? (y/n): y
... coconut milk? (y/n): n
... cow milk? (y/n): y
... goat milk? (y/n): y
... hemp milk? (y/n): n
... oat milk? (y/n): y
... rice milk? (y/n): n
... soy milk? (y/n): y
Wow! You have tried 5 different kinds of milk (out of 8).
Question 9 (cont’d)

BONUS Part 1:
Write your Python code such that it does not include the actual number 8 in its last print statement like this: `print("Wow! You ... (out of 8).")`
Instead, your program must compute this number by calling a function.

Here is a sample run with the BONUS Part 1:

```
How many different types of milk have you tried?
For example, have you tried ...
... almond milk? (y/n): y
... coconut milk? (y/n): n
... cow milk? (y/n): y
... goat milk? (y/n): y
... hemp milk? (y/n): n
... oat milk? (y/n): y
... rice milk? (y/n): n
... soy milk? (y/n): y
Wow! You have tried 5 different kinds of milk (out of 8).
```
Question 9 (cont’d)

Problem Statement: (cont’d)

After your Milk Survey Bot has printed the number of different kinds of milk the user has tried, it then prints the names of the milks the user has tried.

Hint: This printing must be done after (outside) the loop.

Here is a sample run with the BONUS Part 2:

```
How many different types of milk have you tried?
For example, have you tried ...
... almond milk? (y/n): y
... coconut milk? (y/n): n
... cow milk? (y/n): y
... goat milk? (y/n): y
... hemp milk? (y/n): n
... oat milk? (y/n): y
... rice milk? (y/n): n
... soy milk? (y/n): y
Wow! You have tried 5 different kinds of milk (out of 8).
BONUS PART - You tried:
almond
cow
goat
oat
soy
```