CS 1340:Fall 2020:Lecture 14

Intro to Python for CS and Data Science

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Repetition Practice

Empty Square

- write code to draw an empty square based upon a value entered by the user. If the user entered 6, the output should be:

```
******
*    *
*    *
*    *
*    *
******
```

Right Triangle

- write code to draw a right leaning right triangle based upon the value entered by the user. If the user entered 6, the output should be:

```
     *
    **
   ***
  ****
 *****
******
```

- … Now do it and only output the outline of the triangle.

Functions

A Function is ..

- A **function** is a named set of statements.
- Parts
  - **function definition** - the new functions name and the statements that make up the function
  - **function call** - the invocation of the function (asking the function to be executed)

Functions We’ve Seen

- `print(...)`
- `int(...)`
- `readlines(...)`
- These aren’t magic… someone somewhere wrote code that is executed every time you call them.

Function Example

```python
def some_function():
  human_years = 3
  dog_multiplier = 7

  dog_age = human_years * dog_multiplier
  print(dog_age)

some_function()
```

Pizza Area

```python
def print_pizza_area():
    pi_val = 3.14159265

    pizza_diameter = 12.0
    pizza_radius = pizza_diameter / 2.0
    pizza_area = pi_val * pizza_radius * pizza_radius
    print('{:.1f} inch pizza is {:.3f} square inches'
        .format(pizza_diameter, pizza_area))

print_pizza_area()
```

```
12.0 inch pizza is 113.097 square inches
```

Function - Some Details

- `def fun_name():` <– Don't forget the ()
- Functions need to be defined above any calls to that function
- Each line of code inside a function should be indented one level
- Functions can contain other control structures such as ifs and loops

Function Parameters

- **Parameter** - a piece of data that is needed for a function to execute
  - Example: A function to calculate a tip will need the amount of the check
- **Argument** - an actual value that is used in a function call to pass to a parameter

```python
def tip_calculator(check_amount):
  tip_percentage = .2
  print ("20% tip on", check_amount, "is", tip_percentage)

tip_calculator(34.21)
```

- **check_amount** is the parameter; **34.21** is the argument.

Multiple Parameters

- a function can take multiple parameters.
- separate each parameter with a comma.

```
def fountain_volume(length, width, depth):
  volume = length * width * depth
  print("The fountain is", volume, "cubic feet")

fountain_volume(10, 5, 2)
```

```
The fountain is 100 cubic feet
```