

# Python 3 Control Structures

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September 2019

## 1 Introduction to Functions

### 1.1 Topics Covered

- (i) Define your own problem
- (ii) Local vs global variables
- (iii) Default parameters
- (iv) `docstring`

### 1.2 What is a fn?

- Fn: group of statements that performs spec task
- Often used to break down programs into small, manageable pieces (code organized)
  - Code is easier to read, test, debug
  - Can reuse chunks of code
- Update in one place (less chance of introing error)

### 1.3 Define Your Own Fn

- `None` object returned if no values are passed back where fn was called
- To return multiple values, use something like `return x, y` → this will be passed back into fn as tuple

### 1.4 `"__main__"` Namepsace

- `"__main__"` is name of scope where top-lvl code executes
- `"__main__"` contains global vars
- When program run, built-in var `"__name__"` set to `"__main__"`
- Convention to include:

```
1 if __name__ == "__main__":
2     # run this when this is main program
```
- Allows us to run main script/import fns from the file to use in another file's program

### 1.5 Local vs Global Variables

- Local vars destroyed when fn ends
- Python checks for local vars 1<sup>st</sup>, then global

### 1.6 Parameters: Default Values

- Parameter can be assigned to default value
  - ex: `def fn_name(param1 = value1):`
  - If `param1` not called, default value will be used
- **Once one parameter given default value, all parameters to right MUST have default values**
  - Error: `def fn_name(p1=val1, p2, p3):`

```

1  def greet(name, salutation='Hello'):
2      print(salutation + ', ' + name)
3
4  if __name__ == "__main__":
5      greet('Alice', 'Good morning')
6      greet('Bob') # use default value for salutation
7      greet(salutation='Hi', name='Charlie') # key word arguments out of order
8
9  Good morning, Alice
10 Hello, Bob
11 Hi, Charlie

```

## 1.7 docstring

- Good practice to include comment header for each fn
  - Describe what fn does, its arguments, what it returns, etc.
  - Comment must start on line just below fn header
  - Format as multi-line docstring, using """
  - Should be indented
- Contents of docstring are displayed when `help(function_name)` called