Getting started with functions

Spoken Tutorial Project
http://spoken-tutorial.org
National Mission on Education through ICT

http://sakshat.ac.in

Script: Thirumalesh H S

Narrator: Kiran Kishore

IIT Bombay

19 November 2015

In this tutorial we will learn,

In this tutorial we will learn,

- ▶ Define a function.

Objectives

In this tutorial we will learn,

- Define a function.
- Define functions with arguments.

Objectives

In this tutorial we will learn,

- **Define a function.**
- **Define functions with arguments.**
- **Learn about `docstrings`.**

Objectives

In this tutorial we will learn,

- ▶ **Define a function.**
- ▶ **Define functions with arguments.**
- ▶ **Learn about `docstrings`.**
- ▶ **Learn about function return value.**

Objectives

In this tutorial we will learn,

- ▶ **Define a function.**
- ▶ **Define functions with arguments.**
- ▶ **Learn about `docstrings`.**
- ▶ **Learn about function return value.**
- ▶ **Read and understand code.**

System Specifications

System Specifications

- **Ubuntu Linux 14.04**

System Specifications

- **Ubuntu Linux 14.04**
- `Python 2.7.6`

System Specifications

- **Ubuntu Linux 14.04**
- `Python 2.7.6`
- `IPython 4.0.0`

To practice this tutorial, you should know how to -

To practice this tutorial, you should know how to -

- ► **use conditionals**

To practice this tutorial, you should know how to -

- ▶ **use conditionals**
- ▶ **use loops**

Pre-requisite

To practice this tutorial, you should know how to -

- ► **use conditionals**
- ► **use loops**

If not, see the pre-requisite Python tutorials on http://spoken-tutorial.org

Function

- **Eliminate code redundancy**

Function

- Eliminate code redundancy
- Help in code reuse

Function

- **Eliminate code redundancy**
- **Help in code reuse**
- **Subroutine**
  - **relatively independent of remaining code**

Define f(x) in Python

```
def f(x):
    return x*x
```

```
def f(x):
    return x*x
```

- **def** - **keyword**

Define f(x) in Python

```
def f(x):
    return x*x
```

- ▶ **def** - keyword
- ▶ **f** - function name

Define `f(x)` in Python

```
def f(x):
    return x*x
```

- **`def`** - keyword
- **`f`** - function name
- **`x`** - parameter / argument to function **`f`**

Exercise 1

- Write a python function named **cube** which computes the cube of a given number n.

- Write a python function named `avg` which computes the average of `a` and `b`.

Docstring

- ▶ **Documenting/commenting code is a good practice**

Docstring

- **Documenting/commenting code is a good practice**

```
def avg(a,b):
    """ avg takes two numbers as input
    (a & b), and returns the average
    of a and b"""
    return (a+b)/2
```

Docstring

- **Documenting/commenting code is a good practice**

```
def avg(a,b):
    """ avg takes two numbers as input
    (a & b), and returns the average
    of a and b"""
    return (a+b)/2
```

- **Docstring**
  - written in the line after the `def` line.

Docstring

- **Documenting/commenting code is a good practice**

```
def avg(a,b):
    """ avg takes two numbers as input
    (a & b), and returns the average
    of a and b"""
    return (a+b)/2
```

- **Docstring**
  - written in the line after the `def` line.
  - Inside triple quote.

Docstring

- **Documenting/commenting code is a good practice**

```
def avg(a,b):
    """ avg takes two numbers as input
    (a & b), and returns the average
    of a and b"""
    return (a+b)/2
```

- **Docstring**
  - written in the line after the `def` line.
  - Inside triple quote.

- **Documentation : `avg?`**

▶ **Add `docstring` to the function `f`.**

```
def f(x):
    return x*x
```

```
def f(x):
    """Accepts a number x as
    argument and, returns the
    square of the number x."""
    return x*x
```

- Write a python function named `circle` which returns the area and perimeter of a circle given radius `r`.

what

```
def what( n ):
    if n < 0: n = -n
    while n > 0:
        if n % 2 == 1:
            return False
        n /= 10
    return True
```

```python
def even_digits( n ):
    """returns True if all the digits
    of number n is even returns False
    if all the digits of number n is
    not even"""
     if n < 0: n = -n
     while n > 0:
         if n % 2 == 1:
             return False
         n /= 10
    return True
```

```
def what( n ):
    i = 1
    while i * i < n:
        i += 1
    return i * i == n, i
```

is_perfect_square

```python
def is_perfect_square( n ):
    """returns True and square root of
    n, if n is a perfect square,
    otherwise returns False and the
    square root of the next perfect
    square"""
    i = 1
    while i * i < n:
        i += 1
    return i * i == n, i
```

Summary

In this tutorial, we have learnt to,

- ▶ Define functions in Python by using the keyword `def`.

In this tutorial, we have learnt to,

- Define functions in Python by using the keyword `def`.
- Call the function by specifying the function name.

Summary

- **Assign a `docstring` to a function by putting it as a triple quoted string.**

Summary

- Assign a **docstring** to a function by putting it as a triple quoted string.
- Pass parameters to a function.

Summary

- Assign a `docstring` to a function by putting it as a triple quoted string.

- Pass parameters to a function.

- Return values from a function.

1. **What will the function do?**

```
def what(x)
        return x*x
```

Evaluation

1. **What will the function do?**

   ```
   def what(x)
       return x*x
   ```

   - ▸ **Returns the square of x**
   - ▸ **Returns x**
   - ▸ **Function doesn't have docstring**
   - ▸ **Error**

2. **How many arguments can be passed to a python function?**

2. **How many arguments can be passed to a python function?**
   - ▶ **None**
   - ▶ **One**
   - ▶ **Two**
   - ▶ **Any**

Evaluation

2. **How many arguments can be passed to a python function?**
   - **None**
   - **One**
   - **Two**
   - **Any**

3. **Write a function which calculates the area of a rectangle.**

Solutions

1. **Error**

2. **Any**

3. ```
   def area(l,b):
       return l * b
   ```

Forum to answer questions

- **Do you have questions in THIS Spoken Tutorial?**
- **Choose the minute and second where you have the question.**
- **Explain your question briefly.**
- **Someone from the FOSSEE team will answer them. Please visit**

http://forums.spoken-tutorial.org/

Forum to answer questions

▶ **Questions not related to the Spoken Tutorial?**

▶ **Do you have general / technical questions on the Software?**

▶ **Please visit the FOSSEE Forum**

http://forums.fossee.in/

▶ **Choose the Software and post your question.**

Textbook Companion Project

- **The FOSSEE team coordinates coding of solved examples of popular books**

- **We give honorarium and certificate to those who do this**

For more details, please visit this site:

http://tbc-python.fossee.in/

Acknowledgements

- **Spoken Tutorial Project is a part of the Talk to a Teacher project**
- **It is supported by the National Mission on Education through ICT, MHRD, Government of India**
- **More information on this Mission is available at:**
  http://spoken-tutorial.org/NMEICT-Intro

THANK YOU!

For more Information, visit our website
http://fossee.in/