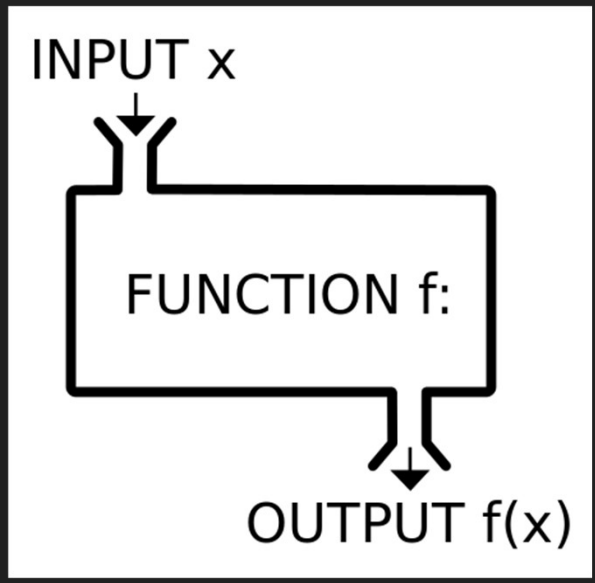
# CENG 113 – Programming Basics

## Lab 10 - FUNCTIONS

# Functions

- Responsible from a **specific** and probably **monotonous** job.
- Help us to get rid of **redundancy**.
- Provide **reusable** & **maintainable** code.
- May or may not have **inputs** (**parameters** or **arguments**) and **outputs** (**return** values).




```
def get_speed(distance, time):
    return(distance/time)
```

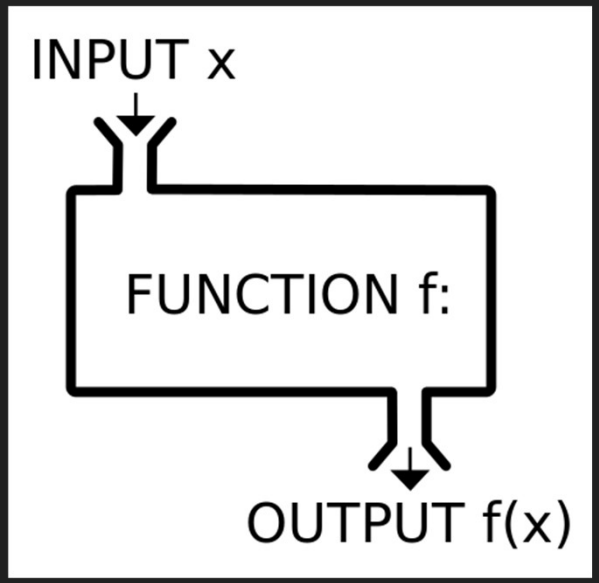
**PEP 8**
**Naming**
**Conventions**

1) **No parameter + No return**

```
def print_random_area():
    print(3.14*(random.randint(5,20)**2))
```

1) **Parameter + No return**

```
def print_area(radius):
    print(3.14*(radius**2))
```




1) **Default Parameter + No return**

```
def print_area(radius = 10):
    print(3.14*(radius**2))
```

2) **Parameter + Return**

```
def get_area(radius):
    return 3.14*(radius**2)
```

3) **No parameter + Return**

```
def get_random_area():
    return 3.14*(random.randint(5,20)**2)
```

# Function Call

```
def print_area(r):
    print(3.14*r*r) # Function call 3

def cube(x):
    return x*x*x

def main():
    print_area(10) # Function call 2
    print(cube(3)) # Function call 4 and
5

main() # Function call 1
```

“print” is a built-in function.

# Exercises

# List Overlap

Define following functions:

- A function that generates a list of random integers in **[b, e]** with length of **N**: **get_rand_list**
- A function that takes two lists and returns the intersection of them: **get_overlap**

**In main program,**

1) Define two randomly generated lists for **b=0**, **e=10**, **N=5**.
2) Print both lists and their overlap.

Hint: You have to include the following lines of code at the beginning of your program:
***import random***
***random.seed(12)***

Use ***random.sample(range(b,e),N)*** for creating the list

# Password Checker

Define a function that takes a password and returns the security level of it. Call this function from main, by getting a user input.

- A password including **spaces** or with length **shorter than 8 characters** is invalid (level = 0)
- Any group of **alphabetic**, **numeric**, and **special characters** increase security level by 1.
- **Example:**

```
                    “abcde12345--”      (Level 3)
                    “ab de12345--”      (Level 0)
                    “abc12--”
        (Level 0)
                    “234567893”
        (Level 1)
```

# Binary to Decimal

Define following functions:

- A function that gets a binary number and converts it to decimal: **binary_to_dec**
- A function that gets a decimal number and converts it to binary: **dec_to_binary**

**In main program**, call each function for **“10010”** and **18** respectively.

**Hint:** Keep binary numbers as string.

# Project Euler Q10

The sum of the primes below 10 is 2 + 3 + 5 + 7 = 17.

Find the sum of all the primes below two million.

- Define a function that gets a number and returns a list of prime numbers: **list_primes()**
- Define a function that returns sum of all primes (the answer): **compute_sum()**