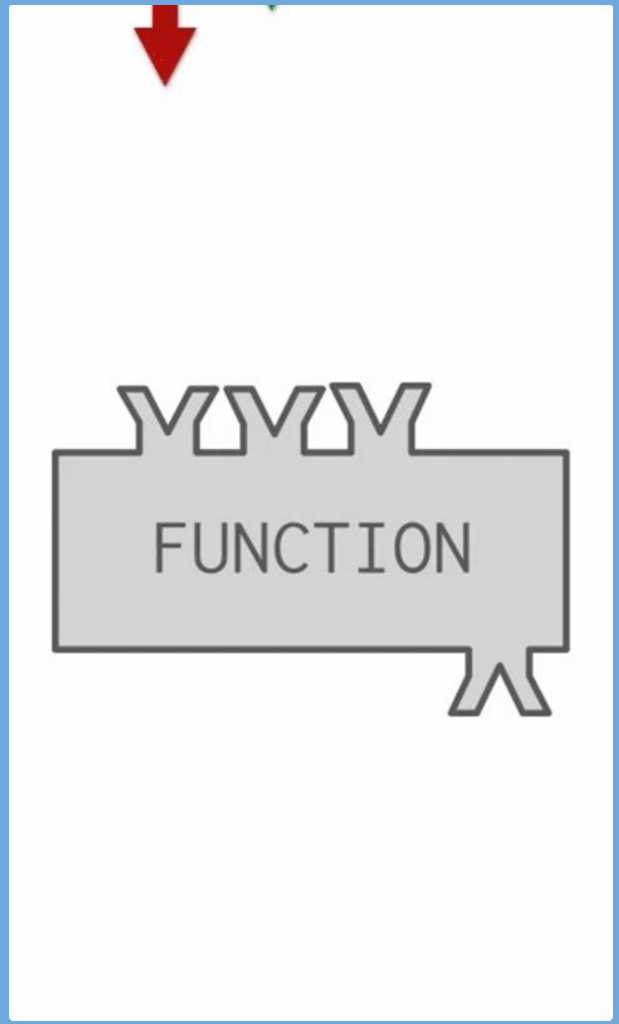
Functions in Python

It’s time to put the “fun” in function



You've used functions before!

A function is a block of code that can be repeatedly used for efficiency - you don't have to write out everything again.

Functions are initiated using parentheses. The object or variable that goes inside the parentheses is known as the parameter.

What are some functions that we have used before?

You've used functions before!

What are some functions that we have used before?

print() len() int() float()

Eg- print("I know functions ! Voila !")

```
strings="Smart"

print(len(strings))
```

Writing Functions in Python

Here's an example of a function:

```
def function_name(parameter1, parameter2):
        if parameter1 > parameter2:
                print("I don't like this")
        return( parameter1 + parameter2)
```

You execute the function by calling the name of the function and adding the parameters you created the function with:
function_name(parameter1, parameter2)

EXAMPLE OF A PYTHON FUNCTION:

```
def Odd_Even(number):
    if number%2==0:
        print("The number is even !")
    else:
        print("The number is odd !")

number=int(input("enter any number: "))
Odd_Even(number)
```

Components of a Function

def - programmers write ‘def’ to tell the compiler that the following code is a function.

parameters - these are the values the function uses, or acts on, in its code. Much like how in the function f(x) = 3x + 7, will multiply any value of x by 3, and then add 7, parameters allow you to execute the same action on any variable via substitution.

Components of a Function

return - Returning is exactly what is sounds like - you give back the result of your code so that it can be used in other code. You do not always need a return statement in every function.

FUNCTIONS WITH RETURN STATEMENT

```
def Odd_Even(number):
    if number%2==0:
        string="The number is even !"
    else:
        string="The number is odd !"
    return(string)

number=int(input("enter any number: "))
print(Odd_Even(number))
```

USER INPUT

To ask the user to enter a value, we use a function called as the input().

The function then reads a line from input, converts it to a string, and returns that.

As the input() always converts any input you provide to the string type, it is necessary to convert it to the appropriate type for use in the program.

Let us see an example.

t.py

```
1  def testing_input_function():
2      A=input("enter a number: ")
3      B=input("enter another number: ")
4      C=A+B
5      print(C)
6  testing_input_function()
7
```

SO LET'S GUESS
WHAT THE PROGRAM WILL PRINT?

```
PS D:\Python Programs> python t.py
enter a number: 5
enter another number: 6
```

SO LET'S GUESS
WHAT THE PROGRAM WILL PRINT?

```
PS D:\Python Programs> python t.py
enter a number: 5
enter another number: 6
56
PS D:\Python Programs>
```

LET US CHANGE THE INPUT TO int:

t.py

```
1  def testing_input_function():
2      A=int(input("enter a number: "))
3      B=int(input("enter another number: "))
4      C=A+B
5      print(C)
6  testing_input_function()
7
```

Now guess the output?

```
PS D:\Python Programs> python t.pyenter a number: 6
enter another number: 7
```

Now guess the output?

```
PS D:\Python Programs> python t.pyenter a number: 6
enter another number: 7
13
PS D:\Python Programs>
```

AWESOME !

Time to start practicing ! Yaay !

1. **Write a function that takes two integers as input and prints the greater number along with a message- “<NUM> is greater than <NUM>! ”**

2. **Write a function that takes an integer and prints “big” if the number is greater than 100 and prints “small” if it is lesser than 100.**

3. **Write a function that determines whether integer is big or small. Then check if it even or odd and print - “Big and even” or “Big and odd” or “Small and odd” or “Small and even”. (Hint: Nested IFs)**
4. **Error checking - for all the functions you created, check to see if the parameters are all integers. If they are not return nothing, and print an error message.**

Share your Talent here!

#1 **Write a function that takes two integers as input and prints the greater number along with a message- “<NUM> is greater than <NUM>! ”**

Code block

2. Write a function that takes an integer and prints “big” if the number is greater than 100 and prints “small” if it is lesser than 100.

#2 Code block

3. Write a function that determines whether integer is big or small. Then check if it even or odd and print - “Big and even” or “Big and odd” or “Small and odd” or “Small and even”. (Hint: Nested IFs)

#3 Code block

4. Error checking -for all the functions you created, check to see if the parameters are all integers. If they are not return nothing, and print an error message.

#4 Code block

Additional Practice

- **Problem 5** Calculator
  - Create a function that takes in a number and solves for addition, subtraction, multiplication, and division
-

Additional Practice

- **Problem 6** Check if year is a leap year
  - Create a function that takes a year as a parameter and prints whether the year is a leap year or not
  - A leap year is defined by the rules:
    - (1) If the year is evenly divisible by 4, go to step 2. Otherwise, go to step 5.
    - (2) If the year is evenly divisible by 100, go to step 3. Otherwise, go to step 4.
    - (3) If the year is evenly divisible by 400, go to step 4. Otherwise, go to step 5.
    - (4) The year is a leap year (it has 366 days).
    - (5) The year is not a leap year (it has 365 days).
  - Check if youre right by comparing your output to: https://www.mathsisfun.com/leap-years.html
-

Additional Practice

- **Problem 7** Check to see if number is prime or not
  - A number is prime if
    - It has no other divisors other than 1 and itself
    - Is a natural number greater than 1

- **Problem 8** Password Checker
  - Create a function that checks if the user inputted an acceptable password
  - A password must: be at least length 10, contain at least 1 uppercase, contain at least 2 symbols (!@#$$%^&*), and at least 4 numbers