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Q1. a. Why Functions are used discuss in detail?

- **Function:**

  A function is a block of code which only runs when it is called.

                    Or

  Functions are basically some instructions in programming language which we want to use repeatedly.

- **Why Functions are used:**

  The first reason is reusability. Once a function is defined, it can be used over and over and over again. You can invoke the same function many times in your program, which saves you work. Another aspect of reusability is that a single function can be used in several different (and separate) programs. When you need to write a new program, you can go back to your old programs, find the functions you need, and reuse those functions in your new program. You can also reuse functions that somebody else has written for you, such as the sine and cosine functions

  The second reason is abstraction. In order to use a particular function you need to know the following things:

  1. The name of the function.
  2. What the function does.
  3. What arguments you must give to the function.
  4. What kind of result the function returns.

  If you just want to use the function in your program, you don't have to know how it works inside! You don't have to understand anything about what goes on inside the function

  For example

  A driver With an automobile, you don't need to understand every detail about the engine and drive train and wheels, if all you want to do is
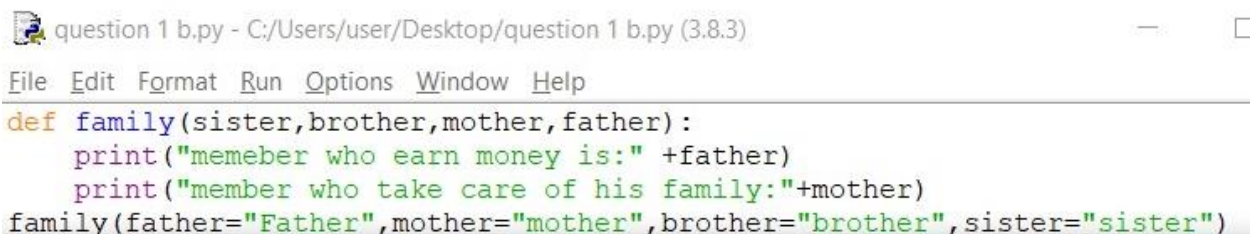
drive the car. Similarly, with a telephone, you don't have to understand everything about the phone system in order to make a call.

The only time you need to know how a function works inside is when you need to write the function, or change how it works. (It's like a car again; you need to know how a car works in order to build one or fix one.) But once a function is written and working, you never need to look at its insides again.

Together, these two reasons make functions extremely useful--practically essential!-for programmers who write large programs.
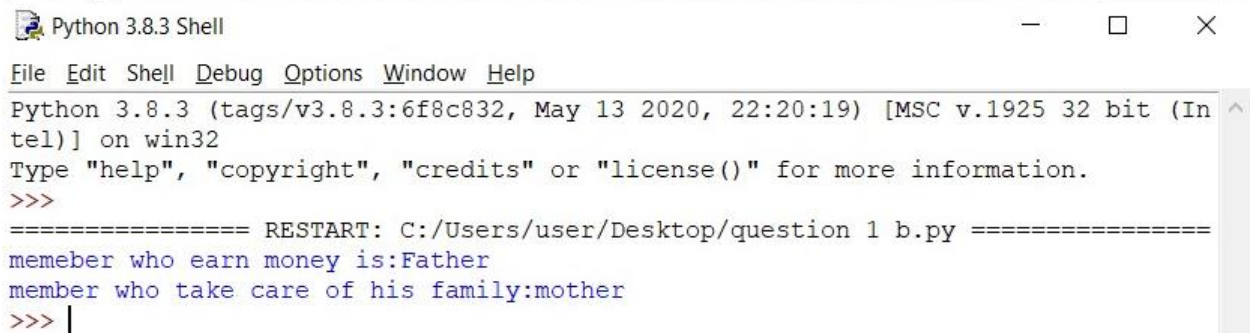
b. How arguments are used in function , write a simple program in Python?

Input :

```
question 1 b.py - C:/Users/user/Desktop/question 1 b.py (3.8.3)
File Edit Format Run Options Window Help
def family(sister,brother,mother,father):
    print("memeber who earn money is:" +father)
    print("member who take care of his family:"+mother)
family(father="Father",mother="mother",brother="brother",sister="sister")
```

Output :

```
Python 3.8.3 Shell
File Edit Shell Debug Options Window Help
Python 3.8.3 (tags/v3.8.3:6f8c832, May 13 2020, 22:20:19) [MSC v.1925 32 bit (In
tel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
================ RESTART: C:/Users/user/Desktop/question 1 b.py ================
memeber who earn money is:Father
member who take care of his family:mother
>>> |
```

- **Explanation of code**
  I have declear a function by the name of family in which parameters are brother ,mother, sister ,father. In 2nd line I have written a print statement like a member who earn money is father. in the 3rd I have written another print statement that is member who take care of his family plus I have pass a variable mother to it which will display the stored value in mother variable in my last line which I have called function which I declare above familyand I pass father value to father variable, mother value to mother variable , brother value to

brother variable and sister value to sister variable. It will store the values according tovariable declared.

Q2. a. Why .upper(),.lower(),capitalize() and .swapcase() function are used ?

- **.upper()**

    The string upper() method converts all lowercase characters in a string into uppercase characters and returns it.

    The syntax of upper() method is:

    string.upper()

- **.lower()**

    The string lower() method converts all uppercase characters in a string into lowercase characters and returns it.

    The syntax of lower() method is:

    string.lower()

- **.capitalize()**

    In Python, the capitalize() method converts first character of a string to uppercase letter and lowercases all other characters, if any.

    The syntax of capitalize() is:

    string.capitalize()

- **.swapcase()**

    The string swapcase() method converts all uppercase characters to lowercase and all lowercase characters to uppercase characters of the given string, and returns it.

    The format of swapcase() method is:

    string.swapcase()

b. Write a program in which the discussed functions are used.
   Note : Q2 part a functions.

Input :

```
2.py - C:/Users/user/Desktop/2.py (3.8.3)
File  Edit  Format  Run  Options  Window  Help
abc="qazi bilal"
x=abc.upper()
z=abc.lower()
c=abc.capitalize()
m=abc.swapcase()
print("The upper case is:"+x)
print("the lower case is:"+z)
print("the capitalize is:"+c)
print("the swap words are:"+m)
```

Output:

```
Python 3.8.3 Shell
File  Edit  Shell  Debug  Options  Window  He
Python 3.8.3 (tags/v3.8.3:6f8c832,
tel)] on win32
Type "help", "copyright", "credit:
>>>
===================== RESTART: C
The upper case is:QAZI BILAL
the lower case is:qazi bilal
the capitalize is:Qazi bilal
the swap words are:QAZI BILAL
>>>
```

- **Explanation of code**

  The functions I have use by the name of upper for the upper alphabets like I have written qazi bilal in small words it will convert it into upper cases "QAZI BILAL". The 2nd function that I have use is lower it will convert qazi bilal in to lower case. The 3rd function that I have use is capitalize it will capital the first word of like Qazi bilal. The 4th is swapcase it makes the catipal alphabets to small and small to capital alphabets.

Q3. a. What are the rules for defining the function?

Rules for defining the function:

The following are some rules for defining function.

- Use the **def** statement when creating a function
- Use a function name that starts with a letter or underscore
- Function names can contain letter, number or underscore.
- Parenthesis **()** follows the function name
- A colon **:** follows the parenthesis
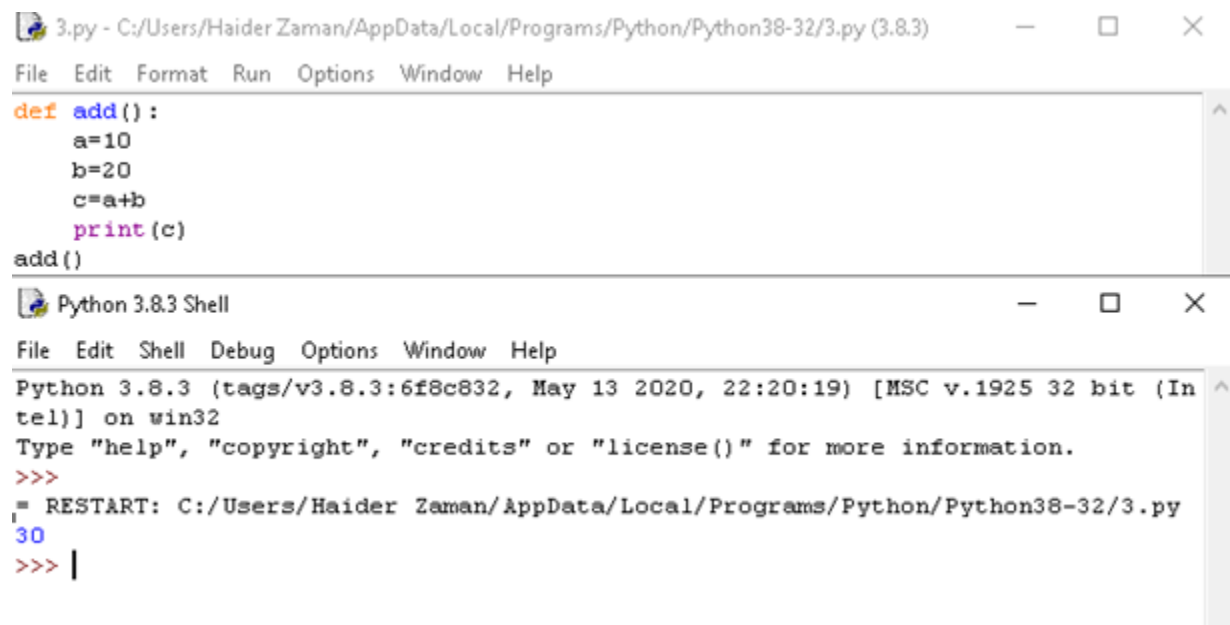- The code for the function is indented under the function definition (4 spaces)
  def function():
- The end of function is denoted by returning to no indentation

Syntax:

def functionname(parameters):
"function_docstring"
function_suite
return [expression]

b. Write a suitable program of our defined function in Python?

- **Explanation of code**

  In this program I have declare a function name "add". In first I am declaring a variable "a" and also assigning 10 to "a" then declaring a variable "b " assigning 20 to "b" and then declaring variable "c" in it I am adding values of both "a and b"amd in the last line I am printing the "c" variable which stores "a+b". and in the last line I am just calling the function name "add"

Q4. a. What are the rules for defining the function and Parameter passing to the function?

Rules for defining function:

Following are the rules for defining a function

- "def" keyword should be used
- unique name for a funtion and that name should follow the paranthesis ()
- The code within every function starts with a colon (:) and should be indented (space)
- The statement return (expression) exits a function, optionally passing back a value to the caller
- Calling a function by simply writing function name having paranthesis()
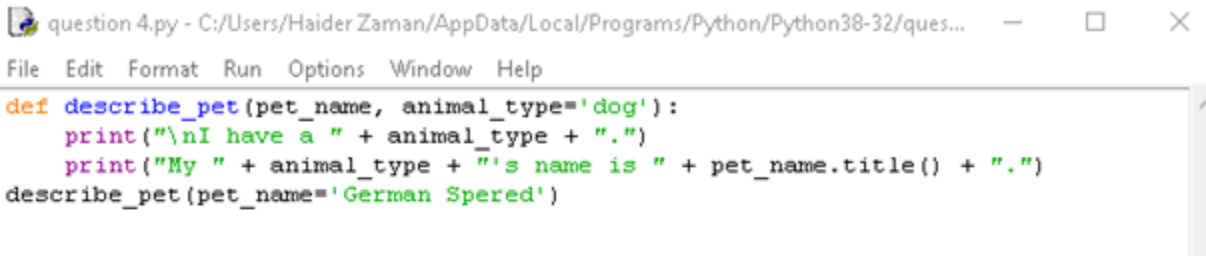
Rules for Parameter passing to the function:

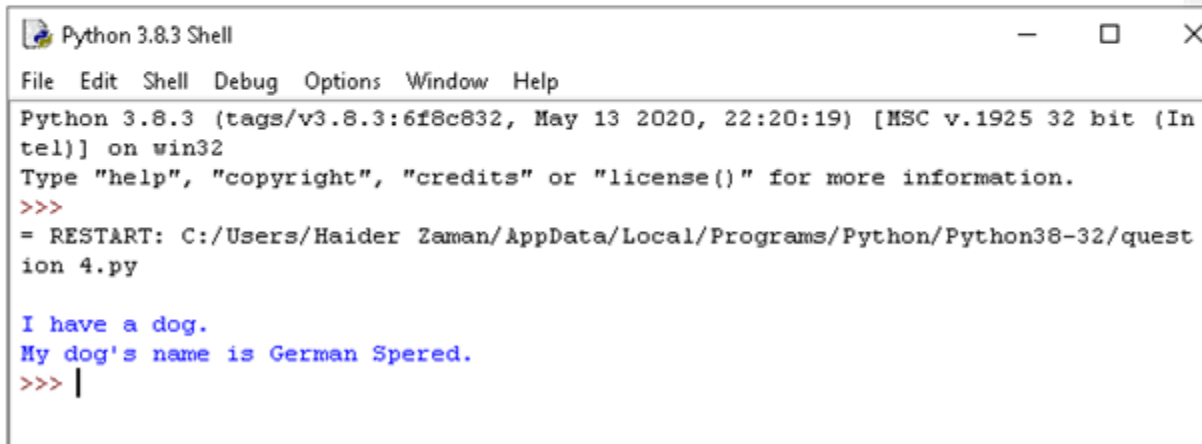Parameters are the data types that are required by the function to be called

Now the rules for parameter passing to a function are:

- Passing the parameters to the function should be seperated by the comma like   **def add (a,b,c):**

  This a,b,c in the brackets are parameters
- Parameters should be written in the brackets( ) of function.

b. Write a suitable program of our defined function by parameter passing in Python?

```
question 4.py - C:/Users/Haider Zaman/AppData/Local/Programs/Python/Python38-32/ques...    —    □    ×

File  Edit  Format  Run  Options  Window  Help

def describe_pet(pet_name, animal_type='dog'):
    print("\nI have a " + animal_type + ".")
    print("My " + animal_type + "'s name is " + pet_name.title() + ".")
describe_pet(pet_name='German Spered')
```

```
Python 3.8.3 Shell    —    □    ×

File  Edit  Shell  Debug  Options  Window  Help

Python 3.8.3 (tags/v3.8.3:6f8c832, May 13 2020, 22:20:19) [MSC v.1925 32 bit (In
tel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: C:/Users/Haider Zaman/AppData/Local/Programs/Python/Python38-32/quest
ion 4.py

I have a dog.
My dog's name is German Spered.
>>>
```
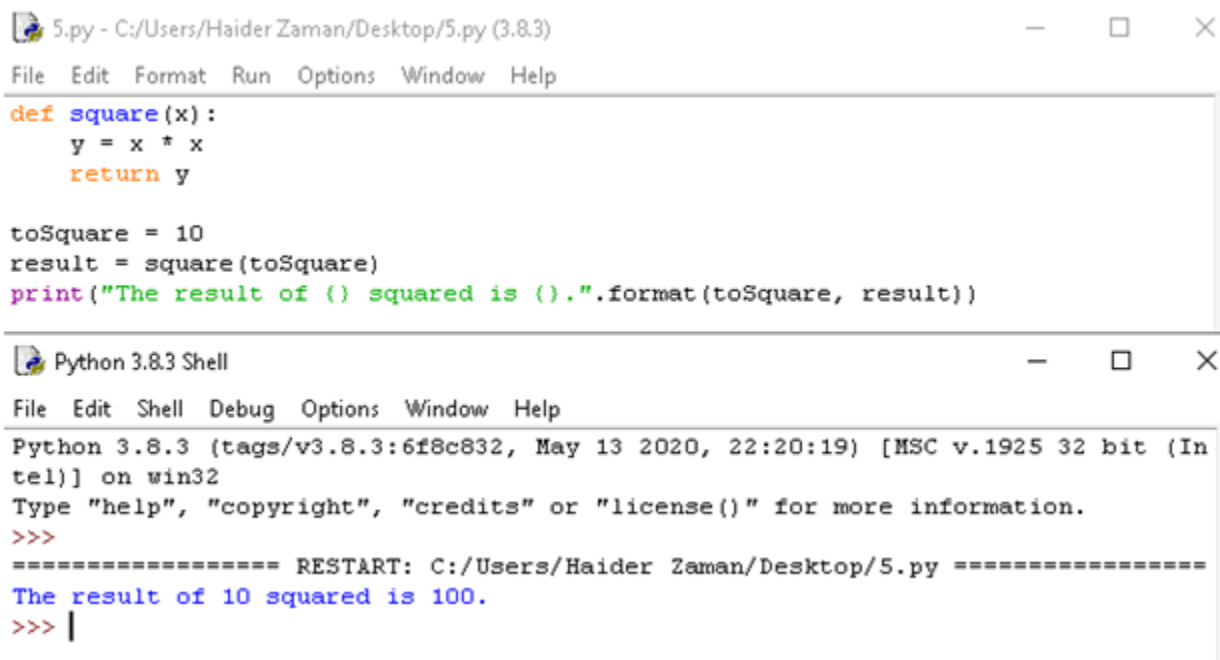
- **Explanation of code**

  I am declaring a function by the name of describe path which I am passing two parameters pet name and animal type in which I am assigning the value of dog. I am then printing a line and then a second line and at last I am calling my default function and I am passing a parameter or a value to pet name by the name of german shepherd .I have used a function by the name of title. The title function what does is if have written the german shepherd as "g" in small and shepherd "s" in small so it will automatically convert the small "g' to capital "g" and small "s" to capital "s"

Q5. a. What are return values to a Function discuss in detail?

The **return** statement is followed by an expression which is evaluated. Its result is returned to the caller as the "fruit" of calling this function. Because the return statement can contain any Python expression we could have avoided creating the **temporary variable**

b. Write a suitable program of a Function with returning value?

```
def square(x):
    y = x * x
    return y


toSquare = 10
result = square(toSquare)
print("The result of {} squared is {}.".format(toSquare, result))
```

```
Python 3.8.3 (tags/v3.8.3:6f8c832, May 13 2020, 22:20:19) [MSC v.1925 32 bit (In
tel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
================== RESTART: C:/Users/Haider Zaman/Desktop/5.py ==================
The result of 10 squared is 100.
>>> |
```

- **Explanation of code**
  I have declare a function by name of square in which I am passing a parameter of x and then I am declaring a variable y in which I am going to store x * x it will return us y which will be the multiplication of x into x. In second line I am going to declare a variable by the name of tosquare and I am assigning a value of 10 to it. Then I am declaring a variable result in which I am going to pass square in which I am passing the parameter of the square function declare above to the square is having the value of 10 which it will by default pass to the square x which mean x will grab the value of 2 square and at the last it will have the result display to us I am using the function by the name of format tosquare and result, what does the format function do ? the format function places the value in the right path or in the bracket which I have made in the string.