

Data Science with Python: Beginner to Advance



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MODULE-04

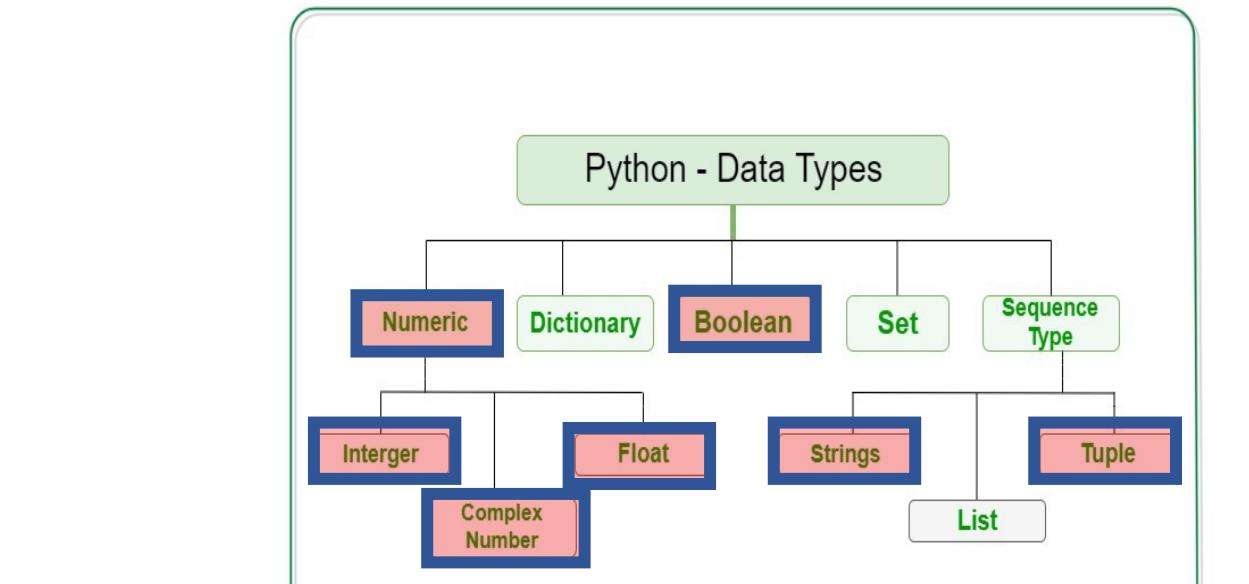


RECAP

Operator	Meaning	Example	Result
+	Addition	5+3	8
-	Subtraction	5-3	2
*	Multiplication	5*3	15
/	Division	10/2	5
>	Greater Than	10 > 2	True
<	Less Than	2 < 10	True
==	Equal to	5 == 5, "Fahim" == "Fahim"	True
!=	Not Equal to	5 != 6, "Fahim" != "Faysal"	True



- Version and Software Installation
- Data Types
- Printing Text
- Simple Operations
- Home Task 01



Name	Type	Description
Integers	int	Whole numbers, such as: 3 300 200
Floating point	float	Numbers with a decimal point: 2.3 4.6 100.0
Strings	str	Ordered sequence of characters: "hello" 'Sammy' "2000" "楽しい"
Lists	list	Ordered sequence of objects: [10,"hello",200.3]
Dictionaries	dict	Unordered Key:Value pairs: {"mykey": "value", "name": "Frankie"}
Tuples	tup	Ordered immutable sequence of objects: (10,"hello",200.3)
Sets	set	Unordered collection of unique objects: {"a","b"}
Booleans	bool	Logical value indicating True or False

RECAP

FLOATS

EXPONENTIATION

QUOTIENTS

REMAINDER

STRINGS

BACKSLASHES

NEW LINES

CONCATENATIONS

STRING
OPERATIONS

VARIABLES

LET'S SOLVE HOME TASK 01

Solve all the Questions and Submit each of them with one python file:

Q1: Sheikh have 20 emails, He deleted 4. Then he forwarded the rest of the emails to four persons dividing equally. How many emails got each of them. Design code of your own.

Q2: Type your Name and Birth date. Show the output which can calculate Your age.

Q3: There were 20 cyclones in the Bay of Bengal in last 5 years from September to February each year. Suppose, each month have equal cyclones each year. Calculate the total cyclone of January month for last 5 years. Design your own code.

SEE THE SOLUTION PDF

LET'S SOLVE HOME TASKS 2

Solve all the Questions and Submit each of them with ONE python file: (**Code your own with you have learned from the course till now**)

- a) As a CEO of your company, you can have 20% of the company's profit as your salary per month. Last year, from January to April the company purchased 30,000 BDT each of months and sold 50,000 BDT products each of months. From May to December purchased 20,000 BDT each of months and sold out 45,000 BDT products each of months. If you calculate your total salary of last year, how much it is?
- b) Suppose, Last year at June, Sylhet had a rainfall of 20cm, Chattogram had 40cm, Dhaka 35 cm. But, Bogura had only 20mm. If, Sylhet, Chattogram and Dhaka decreased by 5cm of rainfall on every next months till October and Bogura increased by 2cm on every next month till October, then calculate the total rainfall of each area at the end of October.
- c) Some bricks of 12cm (Length), 6cm (Width), and 2cm (height) size is using to build a wall of 100m² Area. How many full bricks can be used to build the wall? (*Hint: brick area = length x width*)

SEE THE SOLUTION PDF

LET'S SOLVE HOME TASKS 03

Solve all the Questions and Submit each of them with ONE python file: **(Code your own with you have learned from the course till now)**

1. Write a program that switches the values stored in the variables a and b. Your program should work for different inputs. e.g. any value of a and b.

🚫 Don't change the code below ↗

```
a = input("a: ")
b = input("b: ")
# 🚫 Don't change the code above ↗
#####
#Write your code below this line ↗
```

#Write your code above this line ↗

```
#####
# 🚫 Don't change the code below ↗
```

```
print("a: " + a)
print("b: " + b)
```

2. There are errors in all of the lines of code. Fix the code so that it runs without errors. The output in your program should match the example output shown below exactly, character for character, even spaces and symbols should be identical, otherwise the tests won't pass.

When you run your program, it should print the following:

Day 1 - String Manipulation

String Concatenation is done with the "+" sign.

e.g. `print("Hello " + "world")`

New lines can be created with a backslash and n.

#Fix the code below ↗

```
print(Day 1-String Manipulation")
```

String Concatenation is done with the '+' sign.'

e.g. `print(Hello + world)`

New lines can be created with a backslash and n.")

#Fix the code above ↗

3. Kitty sent a message with Eid Mubarak to her 40 friends on Facebook. Half of them did not even seen the message. Of the seen messages, half of them again forwarded the message to 10 of their friends. How many person got the Eid Mubarak message, keep your answer in the variable named MSG_got.

4. What will be the value of a?

`2 + 3 + 5 + 8 + 13 + a`

use maximum 2 variables to solve this. Keep the answer in variable a.

5. Write a code that can give you a total or summation from a to b.

Suppose,

`a = 10`

`b = 90`

Keep answer in the variable named SUM.

Hint: use formula for the following

$10+11+12+\dots+88+89+90 = ?$

LET'S SOLVE HOME TASKS 03

1. Write a program that switches the values stored in the variables a and b.
Your program should work for different inputs. e.g. any value of a and b.

 Don't change the code below 

```
a = input("a: ")
```

```
b = input("b: ")
```

 Don't change the code above 

```
#####
```

#Write your code below this line 

#Write your code above this line 

```
#####
```

 Don't change the code below 

```
print("a: " + a)
```

```
print("b: " + b)
```



LET'S SOLVE HOME TASKS 03

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 Don't change the code below 

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```

```
b = input("b: ")
```

 Don't change the code above 

```
#####
```

#Write your code below this line 

#Write your code above this line 

```
#####
```

 Don't change the code below 

```
print("a: " + a)
```

```
print("b: " + b)
```



LET'S SOLVE HOME TASKS 03

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Your program should work for different inputs. e.g. any value of a and b.

 Don't change the code below 

```
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```

```
b = input("b: ")
```

 Don't change the code above 

```
#####
```

#Write your code below this line 

#Write your code above this line 

```
#####
```

 Don't change the code below 

```
print("a: " + a)
```

```
print("b: " + b)
```



LET'S SOLVE HOME TASKS 03

1. Write a program that switches the values stored in the variables a and b.
Your program should work for different inputs. e.g. any value of a and b.

 Don't change the code below 

```
a = input("a: ")
```

```
b = input("b: ")
```

 Don't change the code above 

```
#####
```

#Write your code below this line 

#Write your code above this line 

```
#####
```

 Don't change the code below 

```
print("a: " + a)
```

```
print("b: " + b)
```

c = a



LET'S SOLVE HOME TASKS 03

1. Write a program that switches the values stored in the variables a and b.
Your program should work for different inputs. e.g. any value of a and b.

 Don't change the code below 

```
a = input("a: ")
```

```
b = input("b: ")
```

 Don't change the code above 

```
#####
```

#Write your code below this line 

#Write your code above this line 

```
#####
```

 Don't change the code below 

```
print("a: " + a)
```

```
print("b: " + b)
```

c = a

a = b



LET'S SOLVE HOME TASKS 03

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Your program should work for different inputs. e.g. any value of a and b.

 Don't change the code below 

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```

```
b = input("b: ")
```

 Don't change the code above 

```
#####
```

#Write your code below this line 

#Write your code above this line 

```
#####
```

 Don't change the code below 

```
print("a: " + a)
```

```
print("b: " + b)
```

c = a
a = b
b = c



LET'S SOLVE HOME TASKS 03

1. Write a program that switches the values stored in the variables a and b.
Your program should work for different inputs. e.g. any value of a and b.

 Don't change the code below 

```
a = input("a: ")
```

```
b = input("b: ")
```

 Don't change the code above 

```
#####
```

#Write your code below this line 

```
c = a
```

```
a = b
```

```
b = c
```

#Write your code above this line 

```
#####
```

 Don't change the code below 

```
print("a: " + a)
```

```
print("b: " + b)
```



LET'S SOLVE HOME TASKS 03

1. Write a program that switches the values stored in the variables a and b.
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 Don't change the code below 

```
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```

```
b = input("b: ")
```

 Don't change the code above 

```
#####
```

#Write your code below this line 

```
c = a
```

```
a = b
```

```
b = c
```

#Write your code above this line 

```
#####
```

 Don't change the code below 

```
print("a: " + a)
```

```
print("b: " + b)
```

a, b = b, a



LET'S SOLVE HOME TASKS 03

1. Write a program that switches the values stored in the variables a and b.
Your program should work for different inputs. e.g. any value of a and b.

Don't change the code below

```
a = input("a: ")  
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#  Don't change the code above   
#####  
#Write your code below this line 
```

a, b = b, a

#Write your code above this line

```
#####  
#  Don't change the code below   
print("a: " + a)  
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```

c = a
a = b
b = c



LET'S SOLVE HOME TASKS 03

Solve all the Questions and Submit each of them with ONE python file: **(Code your own with you have learned from the course till now)**

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#####
#Write your code below this line ↗
```

a, b = b, a

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```
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print("a: " + a)
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```

2. There are errors in all of the lines of code. Fix the code so that it runs without errors. The output in your program should match the example output shown below exactly, character for character, even spaces and symbols should be identical, otherwise the tests won't pass.

When you run your program, it should print the following:

Day 1 - String Manipulation

String Concatenation is done with the "+" sign.

e.g. `print("Hello " + "world")`

New lines can be created with a backslash and n.

#Fix the code below ↗

```
print(Day 1-String Manipulation")
```

String Concatenation is done with the '+' sign.'

e.g. `print(Hello + world)`

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#Fix the code above ↗

3. Kitty sent a message with Eid Mubarak to her 40 friends on Facebook. Half of them did not even seen the message. Of the seen messages, half of them again forwarded the message to 10 of their friends. How many person got the Eid Mubarak message, keep your answer in the variable named MSG_got.

4. What will be the value of a?

`2 + 3 + 5 + 8 + 13 + a`

use maximum 2 variables to solve this. Keep the answer in variable a.

5. Write a code that can give you a total or summation from a to b.

Suppose,

`a = 10`

`b = 90`

Keep answer in the variable named SUM.

Hint: use formula for the following

$10+11+12+\dots+88+89+90 = ?$

LET'S SOLVE HOME TASKS 03

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Day 1 - String Manipulation

String Concatenation is done with the "+" sign.
e.g. `print("Hello " + "world")`

New lines can be created with a backslash and n.

#Fix the code below 

```
print(Day 1-String Manipulation")
```

```
print('String Concatenation is done with the '+' sign.')
```

```
e.g. print(Hello + world)
```

```
print(New lines can be created with a backslash and n.")
```

#Fix the code above 

LET'S SOLVE HOME TASKS 03

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e.g. `print("Hello " + "world")`

New lines can be created with a backslash and n.

#Fix the code below 

```
print("Day 1-String Manipulation")
```

```
print('String Concatenation is done with the "+" sign.')
```

Print('e.g. print("Hello" + "world")')

```
print("New lines can be created with a backslash and n.")
```

#Fix the code above 

LET'S SOLVE HOME TASKS 03

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When you run your program, it should print the following:

```
#Fix the code below   
print("Day 1-String Manipulation")  
print('String Concatenation is done  
with the "+" sign.')  
Print('e.g. print("Hello" + "world")')  
print("New lines can be created with a  
backslash and n.")  
#Fix the code above 
```

Day 1 - String Manipulation

String Concatenation is done with the "+" sign.
e.g. `print("Hello" + "world")`

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#Fix the code below

```
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String Concatenation is done with the "+" sign.  
e.g. print("Hello" + "world")  
New lines can be created with a backslash and n."")  
#Fix the code above 
```

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1. Write a program that switches the values stored in the variables a and b. Your program should work for different inputs. e.g. any value of a and b.

 Don't change the code below 

```
a = input("a: ")
b = input("b: ")
#  Don't change the code above 
#####
#Write your code below this line 
```

a, b = b, a

#Write your code above this line 

```
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#  Don't change the code below 
```

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2 + 3 + 5 + 8 + 13 + a

use maximum 2 variables to solve this. Keep the answer in variable a.

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Suppose,

a = 10

b = 90

Keep answer in the variable named SUM.

Hint: use formula for the following

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LET'S SOLVE HOME TASKS 03

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4. What will be the value of a?

$$2 + 3 + 5 + 8 + 13 + a$$

use maximum 2 variables to solve this. Keep the answer in variable a.

```
kitty_sent = 40  
msg_seen = kitty_sent // 2  
msg_fwd = (msg_seen // 2)*10  
  
MSG_got = kitty_sent + msg_fwd  
print (MSG_got)
```

```
a = 13  
b = 8  
a = a + b  
  
print (a)
```

LET'S SOLVE HOME TASKS 03

Solve all the Questions and Submit each of them with ONE python file: **(Code your own with you have learned from the course till now)**

1. Write a program that switches the values stored in the variables a and b. Your program should work for different inputs. e.g. any value of a and b.

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#  Don't change the code above 
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New lines can be created with a backslash and n.")

#Fix the code above 

3. kitty_sent = 40

```
msg_seen = kitty_sent // 2
msg_fwd = (msg_seen // 2)*10
```

```
MSG_got = kitty_sent + msg_fwd
print (MSG_got).
```

4. What will be the value of a?

2 + 3 + 5 + 8 + 13 + a

a = 13

b = 8

a = a + b

print (a)

5. Write a code that can give you a total or summation from a to b.
Suppose,

a = 10

b = 90

Keep answer in the variable named SUM.

Hint: use formula for the following

$10+11+12+\dots+88+89+90 = ?$

LET'S SOLVE HOME TASKS 03

5. Write a code that can give you a total or summation from a to b.

Suppose,

a = 10

b = 90

Keep answer in the variable named SUM.

Hint: use formula for the following $10+11+12+\dots+88+89+90 = ?$

For a summation series of some natural numbers:

$$a + (a+1) + (a+2) + \dots + b = \text{SUM}_n$$

$$\text{SUM}_b = \frac{b(b+1)}{2} - \frac{a(a+1)}{2}; S = \frac{n(n+1)}{2}$$
, equation to sum of first n natural numbers.

$$\text{SUM}_b = \frac{n}{2} [2a + (n - 1)d]; n = \text{no. of terms}, d = \text{difference bet^n two successive number}$$

$$\text{SUM}_b = \frac{n}{2} \times (a + b); n = \text{no. of terms}$$

LET'S SOLVE HOME TASKS 03

5. Write a code that can give you a total or summation from a to b.

Suppose,

a = 10

b = 90

Keep answer in the variable named SUM.

Hint: use formula for the following $10+11+12+\dots\dots+88+89+90 = ?$

For a summation series of some natural numbers:

$$a + (a+1) + (a+2) + \dots + b = \text{SUM}_n$$

$$\text{SUM}_b = \frac{b(b+1)}{2} - \frac{a(a+1)}{2}; \quad S = \frac{n(n+1)}{2}$$
, equation to sum of first n natural numbers.

$$\text{SUM}_b = \frac{n}{2} [2a + (n-1)d]; \quad n = \text{no. of terms}, \quad d = \text{difference bet^n two successive number}$$

$$\text{SUM}_b = \frac{n}{2} \times (a + b); \quad n = \text{no. of terms}$$

$$a = 10$$

$$b = 90$$

$$n = (90 - 10) + 1$$

$$\text{SUM} = (n/2) * (a + b)$$

`print(SUM)`



LEARNING





LEARNING
FEARLESS



- ✓ Create Account
- ✓ Verify Email
- ✓ Log in

- ✓ Version Control in PyCharm
- ✓ Select Git/Github
- ✓ Download git for your machine
(windows or others)
- ✓ Commit and Push
- ✓ Log in to your Github in PyCharm
- ✓ Create Repository and Push





- Online
- Get Connected with PyCharm through GitHub
- Use anytime anywhere
- Work together !



INPUT

To get input from the user in Python, you can use the intuitively named `input` function. For example, a game can ask for the user's name and age as input and use them in the game. The `input` function prompts the user for input and returns what they enter as a string (with the contents automatically escaped).

```
x = input()  
print(x)
```

Even if the user enters a number as input, it is processed as a **string**.

You can provide a string to `input()` between the parentheses, producing a prompt message.

```
name = input("Enter your name: ")  
print("Hello, " + name)
```

The prompt message helps to clarify what input the program is asking for.

Working With INPUT

Let's assume we want to take the age of the user as input. We know that the `input()` function returns a string. To convert it to a number, we can use the `int()` function:

```
age = int(input())
print(age)
```

You can convert to float using the `float()` function.

Similarly, in order to convert a number to a string, the `str()` function is used. This can be useful if you need to use a number in string concatenation.

```
age = 42
print("His age is " + str(age))
```

You can use `input()` multiple times to take multiple user inputs.

```
name = input()
age = input()
print(name + " is " + age)
```

In-Place Operator

In-place operators allow you to write code like '`x = x + 3`' more concisely, as '`x += 3`'. The same thing is possible with other operators such as `-`, `*`, `/` and `%` as well.

```
x = 2
print(x)
x += 3
print(x)
```

These operators can be used on types other than numbers, as well, such as strings

```
x = "spam"
print(x)
x += "eggs"
print(x)
```

Walrus Operator

Walrus operator := allows you to assign values to variables within an expression, including variables that do not exist yet.

Let's suppose we want to take an integer from the user, assign it to a variable **num** and output it:



```
num = int(input())
Print (num)
```

The **walrus operator** accomplishes these operations at once:

```
Print (num:=int(input()))
```

NEXT LEVEL



Booleans

Another type in Python is the Boolean type. There are two Boolean values: True and False. They can be created by comparing values, for instance by using the equal operator ==.

```
my_boolean = True  
  
print(my_boolean)  
  
print(2 == 3)  
  
print("hello" == "hello")
```

Comparisons

Another comparison operator, the not equal operator (`!=`), evaluates to True if the items being compared aren't equal, and False if they are. Comparison operators are also called Relational operators.

```
print(1 != 1)
print("eleven" != "seven")
print(2 != 10)
```

Python also has operators that determine whether one number (float or integer) is greater than or smaller than another. These operators are `>` and `<` respectively.

```
print(7 > 5)
print(10 < 10)
```

The greater than or equal to, and smaller than or equal to operators are `>=` and `<=`.

They are the same as the strict greater than and smaller than operators, except that they return True when comparing equal numbers.

```
print(7 <= 8)
print(9 >= 9.0)
```

Greater than and smaller than operators can also be used to compare strings lexicographically (the alphabetical order of words is based on the alphabetical order of their component letters). For example:

```
print("Annie" > "Andy")
```

SOME TIPS AND TRICKS

```
x, y, z = "Orange", "Banana", "Cherry"
print(x)
print(y)
print(z)
```

```
x = y = z = "Orange"
print(x)
print(y)
print(z)
```

```
x = 1      # int
y = 2.8    # float
z = 1j     # complex
a = float(x)
b = int(y)
c = complex(x)
print(a)
print(b)
print(c)
print(type(a))
print(type(b))
print(type(c))

b = "Hello, world!"
print(b[2:5])
print(b[:5])
print(b[2:])
print(b[-5:-2])
print(b.upper())
print(b.lower())
print(b.strip())
print(b.replace("H", "J"))
print(a.split(","))
```

```
quantity = 3
itemno = 567
price = 49.95

myorder = "I want {} pieces of item {} for {} dollars."
print(myorder.format(quantity, itemno, price))

myorder2 = "I want to pay {2} dollars for {0} pieces of item {1}."
print(myorder2.format(quantity, itemno, price))
```

```
x = 5
print(type(x))
```

Example

	Data Type
x = "Hello World"	str
x = 20	int
x = 20.5	float
x = 1j	complex
x = ["apple", "banana", "cherry"]	list
x = ("apple", "banana", "cherry")	tuple
x = range(6)	range
x = {"name" : "John", "age" : 36}	dict
x = {"apple", "banana", "cherry"}	set
x = frozenset({"apple", "banana", "cherry"})	frozenset
x = True	bool
x = b"Hello"	bytes
x = bytearray(5)	bytearray
x = memoryview(bytes(5))	memoryview
x = None	NoneType

QUESTIONS

- a) Write a code to prompt the user with a message and assign the input to the variable "name" using the following words:

Input , What is your name?, name

- b) What will be the output of this code?

```
x = "2"  
y = "4"  
z = int(x) + int(y)  
print(z)
```

- c) What is the result of this code?

```
x = "a"  
x *= 3  
print(x)
```

HOME TASKS 04

Solve all the Questions and Submit each of them with ONE python file: **(Code your own with you have learned from the course till now)**

- a) You have deposited 20,000 BDT in bank for a compound interest of 5% per year. Which means, after one year your balance will be your principal + profit. For the next year (principal + profit) will be counted as your new principal and profit will be calculated on your new principal. And this will go on. What will be your money after 4 years. **[Don't use the formula $C=P(1+r/100)^n]$ [Use in-Place operator]**
- b) Take all the following inputs of a user: **Name, Birth year, Nationality, University/College Name, Living Country, Male/Female, and Mobile number (11 digit)**. **DO NOT USE ANY IF ELSE or Advance CODE**

Then, give a output of his/her profile like following output 

Name: Inputted Name here

Age: * years**

Nationality: ***

University/College: ****

Current Location: Inputted living country name

Mobile Number: +8801*****

Gender: True (if male), False (if female)