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| **Ex. No. 1**  **Date:21.04.2021** | **PYTHON BASIC PROGRAMS** |

**AIM:**

To write simple Python programs.

**PROGRAMMING BASE:**

**I. Variables**

* Variables are containers for storing data values.
* **Creating Variables**
* Python has no command for declaring a variable.
* A variable is created the moment you first assign a value to it

**II. Data Types**

**Built-in Data Types**

Text Type : str

Numeric Types : int, float, complex

Sequence Types : list, tuple, range

Mapping Type : dict

Set Types : set, frozenset

Boolean Type : bool

Binary Types : bytes, bytearray, memoryview

**Type Casting**

* str()
* int()
* float()

**III. Python Operators**

Operators are used to perform operations on variables and values.

Python divides the operators in the following groups:

* Arithmetic operators
* Assignment operators
* Comparison operators
* Logical operators
* Identity operators
* Membership operators
* Bitwise operators

|  |  |
| --- | --- |
| **Operator** | **Name** |
| **Arithmetic Operators** | |
| + | Addition |
| - | Subtraction |
| \* | Multiplication |
| / | Division |
| % | Modulus |
| \*\* | Exponentiation |
| // | Floor division |
| **Assignment Operators** | |
| = | x = 5 |
| += | x += 3 |
| -= | x -= 3 |
| \*= | x \*= 3 |
| /= | x /= 3 |
| %= | x %= 3 |
| //= | x //= 3 |
| \*\*= | x \*\*= 3 |
| &= | x &= 3 |
| |= | x |= 3 |
| ^= | x ^= 3 |
| >>= | x >>= 3 |
| <<= | x <<= 3 |
| **Comparison Operators** | |
| == | Equal |
| != | Not equal |
| > | Greater than |
| < | Less than |
| >= | Greater than or equal to |
| <= | Less than or equal to |
| **Logical Operators** | |
| and | Returns True if both statements are true |
| or | Returns True if one of the statements is true |
| not | Reverse the result, returns False if the result is true |
| **Identity Operators** | |
| is | Returns True if both variables are the same object |
| is not | Returns True if both variables are not the same object |
| **Membership Operators** | |
| in | Returns True if a sequence with the specified value is present in the object |
| not in | Returns True if a sequence with the specified value is not present in the object |
| **Bitwise Operators** | |
| & | AND |
| | | OR |
| ^ | XOR |
| ~ | NOT |
| << | Zero fill left shift |
| >> | Signed right shift |

**a) To swap two numbers with temporary variable**

**Description:**

This program is to swap two numbers using temporary variable.

Sample Input:

10

30

Sample Output:

30

10

**Program:**

‘’’Name: R.Sridevi

Roll.no: 20UIT021

Program name: To swap two numbers with using temporary variables.’’’

#variable definition

a=int(input())

b=int(input())

#swapping two numbers

temp=a

a=b

b=temp

#output

print('{}'.format(a))

print('{}'.format(b))

**Test Cases:**

|  |  |  |
| --- | --- | --- |
| **Test Case No.** | **Input** | **Expected Output** |
| 1 | 10  20 | 20  10 |
| 2 | 100  -50 | -50  100 |
| 3 | 0  0 | 0  0 |
| 4 | -408  -201 | -201  -408 |
| **Total Test Cases** | | **4** |
| **Number of Test Cases Passed** | | **4** |

**b) To swap two numbers without temporary variable**

**Description:**

This program is to swap two numbers without using temporary number.

Sample Input:

10

20

Sample Output:

Before Swapping

10

20

After Swapping

20

10

**Program:**

‘’’Name: R.Sridevi

Roll.no: 20UIT021

Program name: To swap two numbers without using temporary variables.’’’

#declaraing variable

a=int(input())

b=int(input())

print('Before Swapping \n{0} \n{1}'.format(a,b))

#swapping two numbers

a=a+b

b=a-b

a=a-b

#output

print('After Swapping \n{0} \n{1}'.format(a,b))

**Test Cases:**

|  |  |  |
| --- | --- | --- |
| **Test Case No.** | **Input** | **Expected Output** |
| 1 | 10  20 | Before Swapping  10  20  After Swapping  20  10 |
| 2 | 100  -600 | Before Swapping  100  -600  After Swapping  -600  100 |
| 3 | 0  0 | Before Swapping  0  0  After Swapping  0  0 |
| 4 | -310  -549 | Before Swapping  -310  -549  After Swapping  -549  -310 |
| **Total Test Cases** | | **4** |
| **Number of Test Cases Passed** | | **4** |

**c) To find simple interest and component interest**

**Description:**

This program is to find simple interest and compound interest for the given input.

|  |  |
| --- | --- |
| **Formulas for Interests (Simple and Compound)** | |
| SI Formula | S.I. = (Principal × Rate × Time)/100 |
| CI Formula | C.I. = Principal (1 + Rate/n)n\*Time |

Sample Input:

Enter the principal amount : 1000

Enter the rate : 3

Enter the time : 2

Sample Output:

Simple Interest = 60.00

Compound Interest = 1060.90

**Program:**

‘’’Name: R.sridevi

Roll.no: 20UIT021

Program name: To find simple interest and compound interest.’’’

#get the value of principle amount, rate, time

Principle=float(input('Enter the principle amount : '))

rate=int(input('Enter the rate : '))

time=int(input('Enter the time : '))

#calculation of si and ci

si=(principle\*rate\*time)/100

ci=principle\*(1+rate/100)\*\*time

#output

print('Simple Interest = %.2f'%si)

print('Compund Interest = %.2f'%ci)

**Output:**

Enter the principal amount: 1000

Enter the rate: 3

Enter the time: 2

Simple Interest: 60.00

Compound Interest: 1060.90

**d) To perform arithmetic operations on integers values, floats values, characters / strings values**

**Description:**

**Program:**

‘’’Name: R.sridevi

Roll.no: 20UIT021

Program name: To perform arithmetic operations on integers values, floats values, characters/strings values.’’’

#input

a=input('Enter first number ')

b=input('Enter second number ')

#arithmetic calculations

sum=float(a)+float(b)

sub=float(a)-float(b)

mul=float(a)\*float(b)

div=float(a)/float(b)

#output

print('The sum of {0} and {1} is {2}'.format(a,b,sum))

print('The difference of {0} and {1} is {2}'.format(a,b,sub))

print('The multiplication of {0} and {1} is {2}'.format(a,b,mul))

print('The division of {0} and {1} is {2}'.format(a,b,div))

**Output:**

Enter the value of first number: 5

Enter the value of second number: 10

The sum of 5 and 10 is 15

The difference of 5 and 10 is -5

The multiplication of 5 and 10 is 50

The division of5 and 10 is 0.5

**e) Help to solve the riddle**

**Description:**

      i.         Raghav is currently watching Netflix. He is feeling thrilled after watching Seasons 1, 2 and 3 of 13 Reasons Why, and is desperately waiting for release of Season 4. But the makers of the show are in no mood to release the next season anytime soon.

The makers of 13 Reasons Why give Raghav a challenge to solve. If he solves this challenge, then they will give exclusive copy of Season 4 to him.

But Raghav is feeling lazy. Can you help him solve this challenge?

Given 3 integers A, B, C. Do the following steps-

a)     Swap A and B.

b)    Multiply A by C.

c)     Add C to B.

d)    Output new values of A and B.

**Program:**

‘’’Name: R.sridevi

Roll.no: 20UIT021

Program name: To solve the riddle.’’’

#declaraing variable

a=int(input('enter a : '))

b=int(input('enter b : '))

c=int(input('enter c : '))

print('before swapping :',a,b)

#to swap a to b

a,b=b,a

print('after swapping :',a,b)

#multiply a and c

a=a\*c

#add c and b

b=b+c

print('new value of a : ',a)

print('new value of b : ',b)

**Output:**

5

10

3

30

8

**RESULT:**

Thus, the simple Python programs are executed successfully.