Batch:	**P1-3**	**Roll No.: 16014022098**

Experiment / assignment / tutorial No. 1

Grade: AA / AB / BB / BC / CC / CD /DD

Signature of the Staff In-charge with date

TITLE: Basic concepts in python

AIM: 1) Program to find the distance between two points
2) Program to perform string operations.

Expected OUTCOME of Experiment: Use of input output function, arithmetic operators in python and different operations on string.

Resource Needed: Python IDE

Theory:

How the input function works in Python:

- When input() function executes program flow will be stopped until the user has given an input.
- The text or message displayed on the output screen to ask a user to enter input value is optional i.e. the prompt, will be printed on the screen is optional.
- Whatever you enter as input, the input function converts it into a string. If you enter an integer value still input() function convert it into a string. You need to explicitly convert it into an integer in your code using typecasting.

Example:

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

Output:-

```
Enter your name Mahesh
Hello,  Mahesh
```

Python Arithmetic Operators:
Assume variable **a** holds 10 and variable **b** holds 20, then

Operator	Description	Example
+ Addition	Adds values on either side of the operator.	a + b = 30
- Subtraction	Subtracts right hand operand from left hand operand.	a – b = -10
* Multiplication	Multiplies values on either side of the operator	a * b = 200
/ Division	Divides left hand operand by right hand operand	b / a = 2
% Modulus	Divides left hand operand by right hand operand and returns remainder	b % a = 0
** Exponent	Performs exponential (power) calculation on operators	a**b =10 to the power 20
//	Floor Division - The division of operands where the result is the quotient in which the digits after the decimal point are removed. But if one of the operands is negative, the result is floored, i.e., rounded away from zero (towards negative infinity) −	9//2 = 4 and 9.0//2.0 = 4.0, -11//3 = -4, -11.0//3 = -4.0

Strings:
We can create string simply by enclosing characters in quotes. Python treats single quotes the same as double quotes. Creating strings is as simple as assigning a value to a variable.

Example:-
var1= “Hello World”
var2=”Python Programming”

String Special Operators:

Assume string variable **a** holds 'Hello' and variable **b** holds 'Python', then

Operator	Description	Example
+	Concatenation - Adds values on either side of the operator	a + b will give HelloPython
*	Repetition - Creates new strings, concatenating multiple copies of the same string	a*2 will give - HelloHello
[]	Slice - Gives the character from the given index	a[1] will give e
[:]	Range Slice - Gives the characters from the given range	a[1:4] will give ell
in	Membership - Returns true if a character exists in the given string	H in a will give 1
not in	Membership - Returns true if a character does not exist in the given string	M not in a will give 1

String Methods:

Function Name	Description
capitalize()	Converts the first character of the string to a capital (uppercase) letter
casefold()	Implements caseless string matching
center()	Pad the string with the specified character.
count()	Returns the number of occurrences of a substring in the string.
encode()	Encodes strings with the specified encoded scheme
endswith()	Returns “True” if a string ends with the given suffix
expandtabs()	Specifies the amount of space to be substituted with the “\t” symbol in the string
find()	Returns the lowest index of the substring if it is found
format()	Formats the string for printing it to console

Function Name	Description
format_map()	Formats specified values in a string using a dictionary
index()	Returns the position of the first occurrence of a substring in a string
isalnum()	Checks whether all the characters in a given string is alphanumeric or not
isalpha()	Returns “True” if all characters in the string are alphabets
isdecimal()	Returns true if all characters in a string are decimal
isdigit()	Returns “True” if all characters in the string are digits
isidentifier()	Check whether a string is a valid identifier or not
islower()	Checks if all characters in the string are lowercase
isnumeric()	Returns “True” if all characters in the string are numeric characters
isprintable()	Returns “True” if all characters in the string are printable or the string is empty
isspace()	Returns “True” if all characters in the string are whitespace characters

Function Name	Description
istitle()	Returns “True” if the string is a title cased string
isupper()	Checks if all characters in the string are uppercase
join()	Returns a concatenated String
ljust()	Left aligns the string according to the width specified
lower()	Converts all uppercase characters in a string into lowercase
lstrip()	Returns the string with leading characters removed
maketrans()	Returns a translation table
partition()	Splits the string at the first occurrence of the separator
replace()	Replaces all occurrences of a substring with another substring
rfind()	Returns the highest index of the substring
rindex()	Returns the highest index of the substring inside the string
rjust()	Right aligns the string according to the width specified

Function Name	Description
rpartition()	Split the given string into three parts
rsplit()	Split the string from the right by the specified separator
rstrip()	Removes trailing characters
splitlines()	Split the lines at line boundaries
startswith()	Returns “True” if a string starts with the given prefix
strip()	Returns the string with both leading and trailing characters
swapcase()	Converts all uppercase characters to lowercase and vice versa
title()	Convert string to title case
translate()	Modify string according to given translation mappings
upper()	Converts all lowercase characters in a string into uppercase
zfill()	Returns a copy of the string with ‘0’ characters padded to the left side of the string

Problem Definition:

1) Create four variables x1, y1, x2 and y2. Assign each of them a value from user input using the input() function. Calculate distance [result] between two points having co-ordinates as (x1,y1) and (x2,y2) by using operators in python and basic built in math functions.
Finally, use print() to display "The distance between the two points is [result] " in the output.

2) a) Create a variable and assign it the string "Python programming"
   b) Access the character "i" from the variable by index and print it
   c) Find the length of the string
   d) Print the slice "Python" from the variable
   e) Print the slice "program" from the variable
   f) Get the string "thing" from the variable
   g) Convert string into uppercase.
   h) Create another variable and assign it the string " is interesting". Now concatenate both the strings
   i) Apply different string methods given in table.

Implementation details:

```
#Code by Yatendra Yadav
#PP_Exp_1, Program to find the distance between two points &  Program to
perform string operations.

print("To find the distance between two points")

#getting thhe coordinates of points
x1,y1 =input("Enter the Coordinates of first point:").split(",")
x2,y2 =input("Enter the Coordinates of second point:").split(",")

#Printing the Distence between two points
z =((float(x2)-float(x1))**2+(float(y2)-float(y1))**2)**0.5
print("Distance between two points is",z)


#difining string
string="Python Programing"

#accessing 'i'
print(string[-3])

#length of the string
print(len(string))

#Print "Python"
```

```
print(string[0:6])

#prinnt "Program"
print(string[7:-3])

#print "thing"
print((string[2:-13])+(string[-3:]))

#convert string to upper case
print(string.upper)

#connect two string
n="is intresting"
print(string+n)

#check if string is upper case
print("Using 'isupper()'", string.isupper(), "as all the charecter are
not uppercase")

#check if string is lowwer case
print("Using 'islower()'", string.islower(), "as all the charecter are
not uppercase")

#Conver to swapcase
print("Using 'swapcase()'",string.swapcase())

#use of zfill
print("using 'zfill()'",string.zfill(30))

#use of lstrip
print("using 'lstrip()'",string.lstrip())
```

Output(s):

```
                    python -u "c:\C program files\Python Exp\Exp_1.py"
To find the distance between two points
Enter the Coordinates of first point:3,8
Enter the Coordinates of second point:9,2
Distence between two points is 8.48528137423857
i
17
Python
Program
thing
<built-in method upper of str object at 0x000001983225EAB0>
Python Programingis intresting
Using 'isupper()' False as all the charecter are not uppercase
Using 'islower()' False as all the charecter are not uppercase
Using 'swapcase()' pYTHON pROGRAMING
using 'zfill()' 0000000000000Python Programing
using 'lstrip()' Python Programing
PS C:\C program files>
```

Conclusion:
Experiment 1 is complete in doing that we understood the basics concept of Python Programing.

Post Lab Descriptive Questions:-

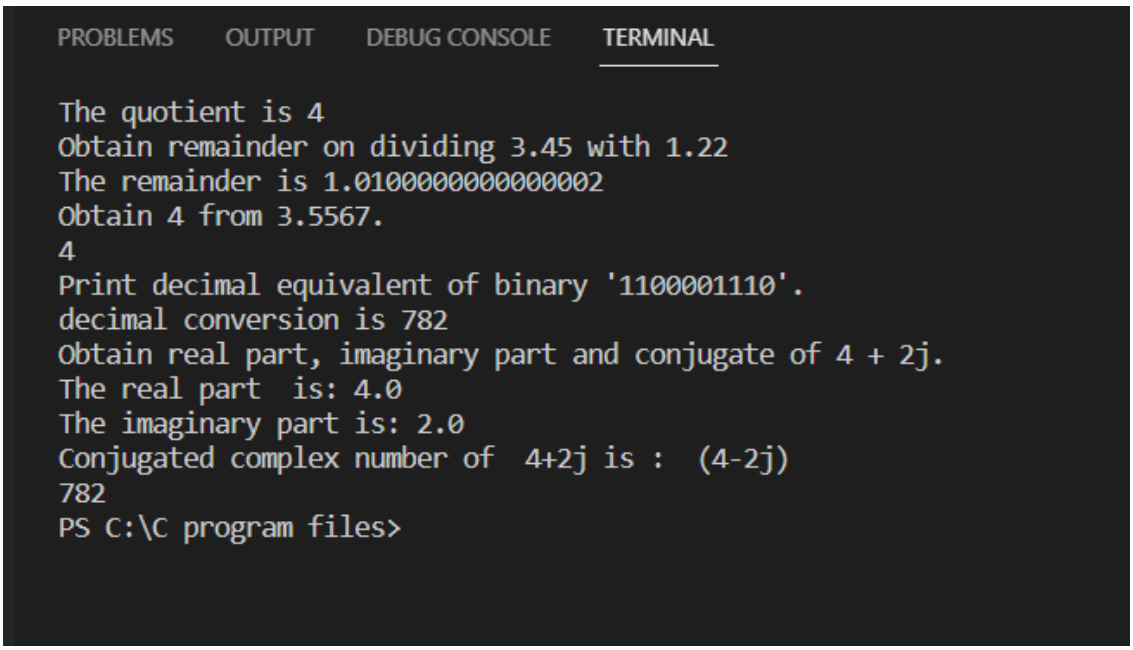
1. **How will you perform the following operations?**
   a. **Obtain integer quotient and remainder while dividing 28 with 6.**
   b. **Obtain remainder on dividing 3.45 with 1.22**
   c. **Obtain 4 from 3.5567.**
   d. **Print decimal equivalent of binary '1100001110'.**
   e. **Obtain real part, imaginary part and conjugate of 4 + 2j.**

Implementation details of Q1:

```
print("Obtain integer quotient and remainder while dividing 28 with 6.")
num1=28
num2=6
print("The reminder is", num1%num2)
print("The quotient is", num1//num2)

print("Obtain remainder on dividing 3.45 with 1.22")
n1=3.45
n2=1.22
print("The remainder is",n1%n2)

print("Obtain 4 from 3.5567.")
print(round(3.5567))
```

```
#First method to calculates the decimal equivalent
print("Print decimal equivalent of binary '1100001110'.")

str=("1100001110")
n=int(str,2)
print("decimal conversion is",n)

print("Obtain real part, imaginary part and conjugate of 4 + 2j.")

x = complex(4+2j)
print("The real part  is:",x.real)
print("The imaginary part is:",x.imag)

print ("Conjugated complex number of  4+2j is : ",x.conjugate() )

#Method 2 to calculates the decimal equivalent

# Function calculates the decimal equivalent
# to given binary number


def binarytodecimal(binary):

    decimal, i = 0, 0
    while(binary != 0):
        dec = binary % 10
        decimal = decimal + dec *(2**i)
        binary = binary//10
        i += 1
    print(decimal)

binarytodecimal(1100001110)
```

Output of Q1:



2. **Which data type will you use to represent the following data values?**
   a. **Number of days in a year**
      Ans- integer data type
   b. **The circumference of a circle**
      Ans- Float data type
   c. **Distance between moon and earth**
      Ans- Float data type
   d. **Whether you will go for a trip?**
      Ans- Boolean data type
   e. **Name of your favourite celebrity**
      Ans- String data type

Books/ Journals/ Websites referred:

1. Reema Thareja, *Python Programming: Using Problem Solving Approach*, Oxford University Press, First Edition 2017, India
2. Sheetal Taneja and Naveen Kumar, *Python Programming: A modular Approach*, Pearson India, Second Edition 2018,India
3. https://www.geeksforgeeks.org/python-strings/?ref=lbp

Date: _____ **Signature of faculty in-charge**