K. J. Somaiya College of Engineering, Mumbai-77

Batch: Roll No.:
Experiment / assignment / tutorial No.
Grade: AA / AB / BB / BC / CC / CD /DD
Signature of the Staff In-charge with date

TITLE: Write a program to demonstrate use of basic data types in Python.
AIM: 1) Program to calculate salary of an employee
        2) Program to perform string operations.
OUTCOME: Student will be able to
    CO1: Formulate problem statement and develop the logic (algorithm/flowchart) for its solution.
    CO2: Understand the concepts of data structures in python.

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

Resource Needed: Python IDE

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

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)

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Output:-
Enter your name Ramesh
Hello, Ramesh

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

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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

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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
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

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Function Name	Description
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
istitle()	Returns "True" if the string is a title cased string
isupper()	Checks if all characters in the string are uppercase

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Function Name	Description
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
rpartition()	Split the given string into three parts
rsplit()	Split the string from the right by the specified separator

Function Name	Description
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) Write a python program to calculate salary of an employee given his basic pay (to be entered by user), HRA = 10 percent of basic pay, TA = 5 percent of basic pay. Define HRA and TA as constants and use them to calculate the salary of the employee.

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
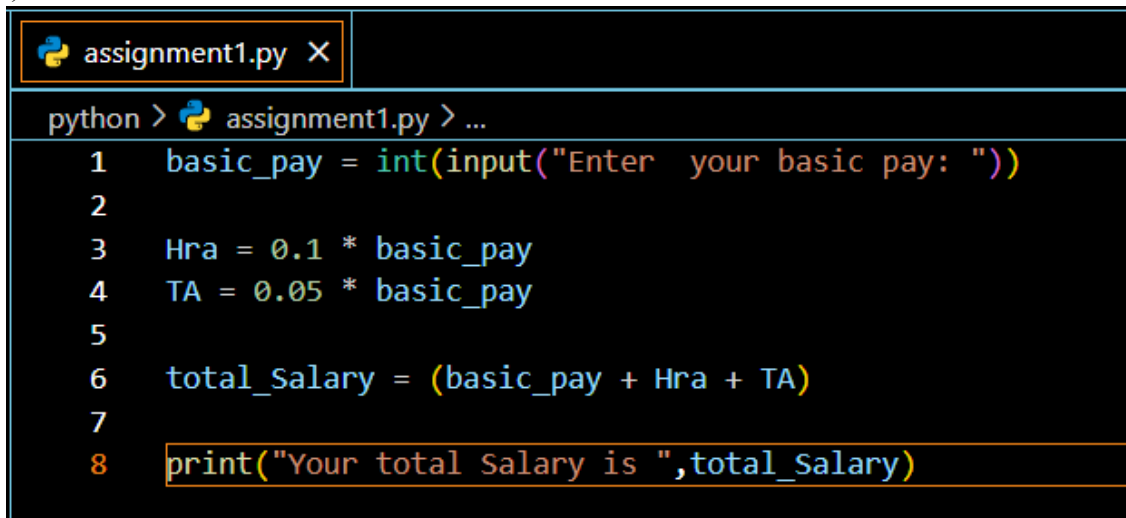   c) Find the length of the string

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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

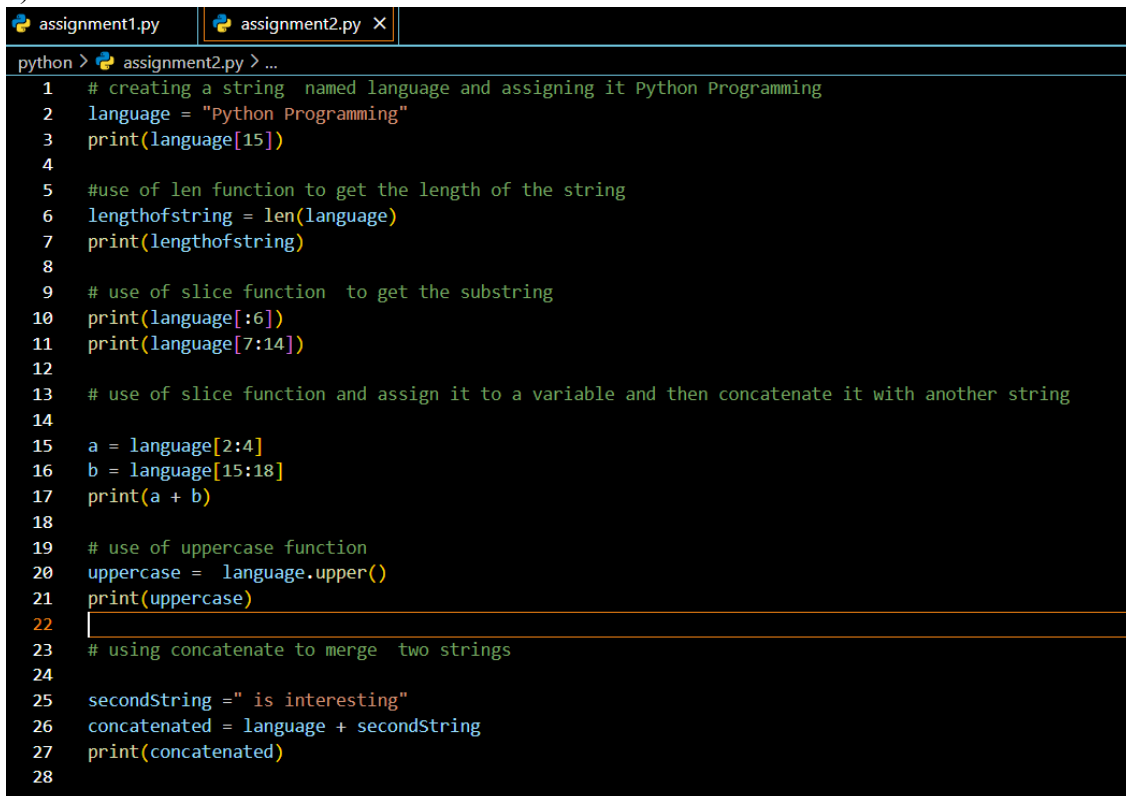i) Apply different string methods given in table.

Implementation details:

i)

```
assignment1.py  ✕

python > 🐍 assignment1.py > ...
1    basic_pay = int(input("Enter  your basic pay: "))
2
3    Hra = 0.1 * basic_pay
4    TA = 0.05 * basic_pay
5
6    total_Salary = (basic_pay + Hra + TA)
7
8    print("Your total Salary is ",total_Salary)
```

ii)

```
assignment1.py      assignment2.py  ✕

python > 🐍 assignment2.py > ...
1    # creating a string  named language and assigning it Python Programming
2    language = "Python Programming"
3    print(language[15])
4
5    #use of len function to get the length of the string
6    lengthofstring = len(language)
7    print(lengthofstring)
8
9    # use of slice function  to get the substring
10   print(language[:6])
11   print(language[7:14])
12
13   # use of slice function and assign it to a variable and then concatenate it with another string
14
15   a = language[2:4]
16   b = language[15:18]
17   print(a + b)
18
19   # use of uppercase function
20   uppercase =  language.upper()
21   print(uppercase)
22
23   # using concatenate to merge  two strings
24
25   secondString =" is interesting"
26   concatenated = language + secondString
27   print(concatenated)
28
29
```

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Output(s):
i)

ii)

Conclusion:i) From the above code we get to learn how to take input from user and how to calculate the salary of a person.
ii)The code includes many operation such as accessing character by index,slicing substrings,finding the length of the string , converting the string to uppercase and concatenating two strings.

Post Lab Descriptive Questions:-

1. **Which data type will you use to represent the following data values?**
   a. **Number of days in a year**
      Ans.int

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b. **The circumference of a circle**
   Ans. float
c. **Distance between moon and earth**
   Ans. float
d. **Whether you will go for a trip?**
   Ans. boolean
e. **Name of your favourite celebrity**
   Ans. String