SHIVAJI COLLEGE, UNIVERSITY OF DELHI

DEPARTMENT OF COMPUTER SCIENCE

INTERNAL ASSIGNMENT

(Academic Year 2023-24)

Name of the Course	: B.Sc Physical Sc with Computer Sc	Semester	: III
Name of the Paper	: Python Programming for Data Handling	Maximum Marks	: 20
Faculty Name	: Abha Vasal	Date of Submission: 20.11.2023	

SET A

1. Write Programs for the following:

a) to compute whether a number is a perfect square.

b) to determine whether a string is a palindrome.

c) sum of the first **n** terms of following series:
$S = 1 - 1/2 + 1/3 - 1/4 + \cdots$

d) greatest common divisor of two numbers (in addition to **n**, another argument **m** is passed to the function)

2. Design a tkinter application to prompt user to accept input for Name, Marks1, Marks2. On pressing the submit button the output should display average marks obtained.
3. You are given a dictionary `priceList = {"Lemon" : 10, "Mango" : 50, "Banana" : 5, "Apple" : 20}`, representing products and their rates.

   - write a function `rate` that accepts this dictionary along with the name of a product and returns the price of that product. If the product does not exist in the dictionary, then it should return -1. For example, if the name of the product is `Apple` then the function should return 20.

   - write another function `update` to modify the dictionary. The function should accept the dictionary, name of a product and new rate for it. The function should return the updated dictionary as per the following cases:

   A. Case 1: if the rate of the product is negative or zero and the product exists in the dictionary then the product should be removed from the dictionary
   B. Case 2: if the rate of the product is positive and the product exists in the dictionary then the rate of the product in the dictionary should be changed to the new rate that is passed to the function
   C. Case 3: if the rate of the product is positive and the product does not exist in the dictionary then the product-rate pair should be added to the dictionary

Abha Vasal

Faculty Signature:

4. Write a Python program to count the number of vowels in a file and write the *vowel: count* in a dictionary.

5. Write a program to read three sides of a triangle and display whether the triangle is a scalene or equilateral or isosceles triangle, provided that the sides entered by the user are positive and they form a valid triangle. The program should have **`assert`** statements to ensure that these two conditions are satisfied.
6. Write a function that accepts the name of a file as an argument and returns the number of lines in the file. The function should return -1 if the specified file does not exist.

Write a function for linear search that accepts two arguments: a list of numbers and a number to be searched. Assume that the list can have duplicate elements. The function should return a list of all the indices corresponding to the element being searched. If the element is not there, then the program should return the list [-1]. For example, if the list is [68, 24, 68, 68, 24, 14] and 68 is to be searched then the function should return [0, 2, 3].

7. Consider the string s='abcdefxyyzxyzxzxyy'. What will be the output for following
   a) print(s.islower(())
   b) print(s.count('xy')
   c) print(s.find('cd'))
   d) print(s.replace('xy','pq')
   e) print((s.split('x'))
8. What will be the output

```
def f(x, L=[]):
    for I in range(x):
            L.append(I * I)
    print(L)
```

   What happens under following function calls
   a) f(2)
   b) f(3,[3,2,1)
   c) f(3)

Faculty Signature:

SET B

Q1 a)Name the string functions to perform the following :

• Checks if all characters in a string are digits
• Checks if all characters in a string are in lower case
• Replaces all occurrences of j with k

Q2) Design a tkinter application that accepts principal, rate and interest and calculates the simple interest

What will be the output of the following code:

```
i = 1

while True:

    if i%2 == 0:

        break

    print( i )

    i += 2
```

Q3 What is the significance of writing functions? Differentiate between local and global parameters giving suitable examples.

Write a function that takes a list as input and returns the square of the maximum value in the list. Write a program that calls this function and prints its output for the input list - lst[12,5,7,1,30,8].

Q4 Give details on different operators available in python

Q5 What will be the output of following. Show step by step evaluations

i. math.ceil(12.33)
ii. 10 + 6 * 2 ** 2 !=9 // 4 -3 and 29 >= 29/ 9
iii. 10 | 15
iv.

```
A= [1,2,4,6,9,10, 14, 15, 17]
for i in range(0, len(A)) :
        if (A[i] %2 ==0):
                A[i] = 5 *i
        elif (A[i] % 3==0):
                A[i]= 6 *2
        else:
                A[i] *=2
print(A)
```

Faculty Signature:

v.
```
N=5
Sum=0
For i in range(1,N):
    For j in range( i, N):
        Sum= Sum + i+j
print(Sum)
```

Q6 Write a program to read 2 number entered by user. The program should have assert statements to ensure that both the numbers are nonnegative. Write a function HighFactor that takes the 2 numbers as input and returns the highest common factor of the 2 numbers.

Q7 Write a function EvenAvg that accepts a list as input argument. The function should check that the list should not be empty and only consists of numbers. If the list is nonempty determine and return average of all even numbers present in the list.

Q8 Print the pattern

A
AB
ABC
ABCD (ask user to input number of lines and print pattern accordingly)

Q8
Write a Python program which reads the data from two input files having Employee Names and merges them into one output file.

Q9 What are dictionaries in python. How are they different from Lists.

Faculty Signature:

SET C

Q1 What would be the output of the following functions:

a)

```
def func1():
    try:
        return 1
    finally:
        return 2
k = func1()
print( k)
```

b)

```
def func2():
    a = 1
    print (a)
 a=123
func2()
print( a)
```

Q2 Write python code for sum of the first **n** terms of following series:
1)$S=1-1/2+1/3-1/4+\cdots$
2)greatest common divisor of two numbers (in addition to **n**, another argument **m** is passed to the function)

Q3
You are given a dictionary priceList = {"Pen" : 10, "Pencil" : 5, "Eraser" : 5, "Ruler" : 20}, representing products and their rates.

a)write a function rate that accepts this dictionary along with the name of a product and returns the price of that product. If the product does not exist in the dictionary, then it should return -1. For example, if the name of the product is Ruler then the function should return 20.

b)write another function update to modify the dictionary. The function should accept the dictionary, name of a product and new rate for it. The function should return the updated dictionary as per the following cases:

Case 1: if the rate of the product is negative or zero and the product exists in the dictionary then the product should be removed from the dictionary
Case 2: if the rate of the product is positive and the product exists in the dictionary then the rate of the product in the dictionary should be changed to the new rate that is passed to the function
Case 3: if the rate of the product is positive and the product does not exist in the dictionary then the product-rate pair should be added to the dictionary

Q4 What are different types of control structures available in python

Faculty Signature:

Q5 What will be the output of following. Show step by step calculations

i. math.floor(67.33)
ii. -6 * 21 + 8 / 16 * 3 + 60
iii. Not(9)
iv. sentence= 'Hello. welcome to the world of coding'

```
print(len(sentence))

print(sentence[17 :-1])

print(sentence[ : -12] + sentence[-12 :])

print(sentence.rfind('co'))

print(sentence.partition('.'))
```

v.
```
Sum=0
N=5
While N >0:
   If N % 2 ==0:
        Sum= Sum + N*2
   N =N-1
print(sum)
```

Q6 Write a Python program to create a CSV file having student data: Roll_No, Enrollment No, Name, Course, Semester.

Q7 Write a function minimum that accepts a list as input argument. The function should check that the list should not be empty. If the list is nonempty determine and return the smallest value in the list else if the list is empty it should return None

Q8 Design a tkinter application to accept student name, course, Ge choice and submit button for students to select Ge option

Q9 What is use of break statement in python. Give example

Faculty Signature:

SET D

Q1 Which of the following fourteen statements (Line 1 to Line 14) have errors? Identify all errors and justify your answers.

```
str = "Hello There" # Line 1
str[6] = 't' # Line 2
print(str[12]) # Line 3
print(str[-2 : -4]) # Line 4
print(str[2 : 12]) # Line 5
lst = list(str) # Line 6
lst[3] = 'i' # Line 7
print(lst[2 : 4]) # Line 8
s = set(str) # Line 9
s[3] = 'i' # Line 10
print(s[2 : 4]) # Line 11
t = tuple(s) # Line 12
t[3] = 'i' # Line 13
print(s[2 : 4]) # Line 14
```

Q2 Consider the following two tuples showing games played by Ramesh and Suresh:

```
gamesRamesh = ('lawn tennis', 'cricket')
gamesSuresh = ('cricket', 'hockey', 'badminton')
```

Write the statements to compute the following:

- games played by Suresh but not Ramesh
- games that are common to both of them
- all the games that are played by either of them
- games that are not common to both of them

Q3 Write a function that accepts the name of a file as an argument and returns the number of lines in the file. The function should return -1 if the specified file does not exist.

Q4 What will be the output

```
def f(x, L=[]):
    for I in range(x):
            L.append(I * I)
    print(L)
```

What happens under following function calls

d) f(2)
e) f(3,[3,2,1)
f) f(3)

Q5 What will be the output of following. Show step by step calculations

i. Math.floor(67.65)

Faculty Signature:

ii. 6 % 10 +1 4 -24 * 5 // 5

iii. 7 | 13

iv.
```
lst = [x * y for x in range(3, 11, 2) for y in range(6, 1, -1) if x * y % 2 == 0 ]
print(lst)
```

v.
```
sum=0
for a in range(5):
    sum +=a**2
print(sum)
```

Q6 Design a tkinter application that prompts a user to enter college rollno, course , section(A,B, None). The students should be able to enter his test score(0 to 100). If the score is greater than 50 display Pass else Fail

Q7 Write a Python program to count the number of vowels in a file and write the *vowel: count* in a dictionary.

Q8 Print the pattern

1
23
456
78910 (ask user to input number of lines and print pattern accordingly)

Q9 Write an assignment statement using single conditional expression

```
If marks >=60:
    Status='pass'
else:
    Status='fail'
```

Faculty Signature:

SET E

Q1 What will be the output produced on execution of the following code segments? Justify your answers.

1)
```
def fun(a = 0, b = 1):
    return a * b
print(fun(5, 6))
print(fun(6))
print(fun(b = 5))
print(fun())
```
2)
```
import copy
lst1 = [13, 23, [38, 42], 52]
lst2 = copy.deepcopy(lst1)
lst3 = lst1
lst2[2][0] = 78
lst3[3] = 61
print(lst1, lst2, lst3)
```

3)
```
def m(s):
    ans = ''
    for i in range(len(s)):
        if i % 2 == 0:
            ans += s[i]
    return ans
print(m('HelloWorld'))
```

Q2 Design a tkinter application to input 3 numbers on pressing submit button display the largest of 3 numbers.

Q3 a)Write differences between List and Sets.

Q4

Write a Python program library to read the CSV file already created (having student data: Roll_No, Enrollment No, Name, Course, Semester.) and filter out records of II semester students.

Q5 Write a user defined function sumsquares(n) in python that accepts a number n as an argument. The function returns sum of squares of first n numbers. Write a python statement to call this function and print the result for n=6.

Q6 What will be the output of following. Show step by step evaluations

i. math.ceil(65.47)
ii. 'bye' < 'Bye' or 'hello' *5 > 'hello'
iii. 10 > 12/ 2.0 *2

Faculty Signature:

iv.
```
import copy
lst1 = [3, 43, [38, 45,90], 74]
lst2 = copy.deepcopy(lst1)
lst3 = lst1
lst2[2][0] = 8
lst3[3] = 6
print(lst1, lst2, lst3)
```

v.
```
sum=0
for i in range(1, 3):
    for j in range(2,4):
        if i==j:
            sum  += i+ j
print("sum is ', sum)
```

Q6. Write a program to read a number entered by user. The program should have assert statements to ensure that the input entered is a number and is positive. Write a function factorial that has an argument n and the function returns the factorial of n. Call the function to find factorial of 5.

Q7 Write a function CountVowel that takes a string as input parameter and calculates & displays the count of vowels. Convert the string in lowercase and then calculate.

Q8 Print the pattern

```
  A
 BB
CCC
DDDD (Ask user to enter number of lines. Check whether n is positive according print pattern)
```

Q9 Write an assignment statement using single conditional expression

```
if age >=18:
    Status='major'
else:
    Status='minor'
```

10. Write a function FnDisnct() to find the distinct elements in given 2 lists L1 and L2 and store them in third List L3. The function should return the List L3

Faculty Signature:

SET F

Q1 What is the output. Explain

a)lst = [x * y for x in range(3, 9, 2) for y in range(6, 1, -1) if x * y % 2 == 0]
print(lst)

b)def fn(a, n):
try:
print(a[n])
except IndexError:
print("In IndexError")
raise ValueError("An error")
except:
print("Some error")
print("Bye")

lst = [1, 2, 3]
try:
fn(lst, 1)
fn(lst, 3)
fn(lst, 2)
except ValueError as msg:
print(msg)

Q2 Design a tkinter application to register customer to enter their name, address, email, phone no. On ressing submit the details must be written to csv file

Q3 Write a program to copy the contents of file1 in file2.

Q4 Write a program to read three sides of a triangle and display whether the triangle is a scalene or equilateral or isosceles triangle, provided that the sides entered by the user are positive and they form a valid triangle. The program should have **assert** statements to ensure that these two conditions are satisfied. Write a python program to accept a string from the user. Replace all vowels in the given string with '*'. Display the modified string.

Q5 What will be the output of following. Show step by step evaluation

i. math.ceil(65.65)
ii. 3 ** 4 //3 +5 >9 or 4 !=9
iii. ~ 17
iv. greeting='Good Morning. Have a Good Day!!
A= greeting.spilt()
B= greeting.capitalize()
C=greeting.partition('.')
D=greeting.count('good')
print(A,B, C, D)

Faculty Signature:

v.
```
sum=0
for i in range(1, 3):
    for j in range(1,3):
        sum  += i*2 +j
print(“sum is ‘, sum)
```

Q6. Consider thesets s1 and s2 defined below

S1= {“p1”, “p2”, “p3”,”p4”, “p5”}

S2={“p1”,”p3”,”p4”}what will be the output produced on execution of following statements

a) set.symmetric_difference(s1, s2)

b) s1.union(s2)

Q7 Write a function for linear search that accepts two arguments: a list of numbers and a number to be searched. Assume that the list can have duplicate elements. The function should return a list of all the indices corresponding to the element 6 being searched. If the element is not there, then the program should return the list [-1]. Ensure that the list contains only numbers. For example, if the list is [68, 24, 68, 68, 24, 14] and 68 is to be searched then the function should return [0, 2, 3].

Q8
Write a Python program to create a CSV file having customer data: Name, address, email address, phone number

Q 9 Differentiate between pass and continue statement

Faculty Signature: