VIT
Vellore Institute of Technology

Final Assessment Test – June 2023

Course: **ITA6017 - Python Programming**

Class NBR(s): **0251 / 0489 / 0538** Slot: **F2**

Time: **Three Hours** Max. Marks: **100**

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KEEPING MOBILE PHONE/SMART WATCH, EVEN IN "OFF"POSITION IS TREATED AS EXAM MALPRACTICE

Answer any TEN Questions

(10 X 10 = 100 Marks)

1. a) Explain the basic principles of python language and how is it advantageous than other languages. **[4]**

   b) Describe the list of python operators and their expression along with their description. Write a python program using Bitwise/operators. **[6]**

2. Explain the basic structure of Loops and their types. Represent the conditions in steps and structure it in the form of flowchart. Write a python program using the looping constructs and represent the output.

3. Write a Python Program to Convert Integer to Roman numeral using function. Use the following symbols to represent Roman numerals: I, V, X, L, C, D and M.

Value	Symbol
1	I
5	V
10	X
50	L
100	C
500	D
1000	M

Test Case:

Input: 58

Output: "LVIII"

Explanation: L = 50, V= 5, III = 3.

4. Define Dictionaries. State the difference between Dictionaries and tuples in table format. Explain in detail about indexing, sorting, object storage (adding and deleting) elements in dictionary with syntax and example. List out various methods and functions in dictionaries along with their description and syntax.

5. Write a program to check whether digits in a number appear more than once using List.

Test Case:

Enter the Digit:12341

Enter the Number to Search:1

Appears More than Once in a List

6. Write a short note on pandas dataframe object. Create your own dataframe object, discuss four Pandas functions that can be applied on Dataframes.

7. Explain in detail about pattern matching in python with Regular Expressions (RegEx).

i) Write a program to extract the protocol and hostname from the given URL: https://www.vit.ac.in using RegEx using meta characters.

ii) Write a program to perform the validation of an e-mail address using string methods. Write the necessary steps required for validation.

8. Consider the following matrix:

$$\begin{bmatrix} 12 & 11 & 10 & 9 \\ 10 & 9 & 8 & 7 \\ 8 & 7 & 6 & 5 \\ 6 & 5 & 4 & 3 \\ 4 & 3 & 2 & 1 \end{bmatrix}$$

(i) Convert the above list into a NumPy array

(ii) Using appropriate slicing techniques, extract the subarrays

$$U = \begin{bmatrix} 12 & 11 \\ 10 & 9 \\ 8 & 7 \end{bmatrix} \qquad V = \begin{bmatrix} 10 & 9 & 8 \\ 8 & 7 & 6 \end{bmatrix}$$

(iii) Find the matrix product B = UV

(iv) Determine the shape of B.

(v) Is it possible to broadcast the row [1 2] with B? Justify your answer.

9. What is an Exception? State three features of exception handling and assertions in table format. List the types of standard exceptions with the description. Explain in detail about two forms of handling an exception using try statement along with their syntax and an example program.

10. a) Explain briefly about the modules available for the python integration with MySQL and list their advantages. Describe the benefits of python for database programming. [4]

b) What is MySQL Connector Python? Write the steps required for connecting MySQL database in python using MySQL Connector Python. Write a python program for creating the Tips table given below by importing MySQL. [6]

	total_bill	tip	sex	smoker	day	time	size
0	16.99	1.01	Female	No	Sun	Dinner	2
1	10.34	1.66	Male	No	Sun	Dinner	3
2	21.01	3.50	Male	No	Sun	Dinner	3
3	23.68	3.31	Male	No	Sun	Dinner	2
4	24.59	3.61	Female	No	Sun	Dinner	4
5	25.29	4.71	Male	No	Sun	Dinner	4
6	8.77	2.00	Male	No	Sun	Dinner	2
7	26.88	3.12	Male	No	Sun	Dinner	4
8	15.04	1.96	Male	No	Sun	Dinner	2
9	14.78	3.23	Male	No	Sun	Dinner	2

11. Define embedded python and its principles. List out the functions for getting information from within C/C++ along with the syntax and an example program. Also state the five - stage process for getting the return values from a function call.

12. Describe the Application development with python using Rapid Application Development (RAD) tool. State the various RAD requirements and its solutions using standard libraries.

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