COMSATS University, Islamabad

Online Assignment 2

Deadline: 31/05/2020

All questions are mapped to CLO-4

Q1. Write a program that plays the popular scissor-rockpaper game. (A scissor can cut a paper, a rock can knock a scissor, and a paper can wrap a rock.) The program randomly generates a number 0, 1, or 2 representing scissor, rock, and paper. The program prompts the user to enter a number 0, 1, or 2 and displays a message indicating whether the user or the computer wins, loses, or draws. Your program should lets the user play continuously until either the user or the computer wins more than two times.

Q2. Given three integers, determine how many of them are equal to each other. The program must print one of these numbers: 3 (if all are the same), 2 (if two of them are equal to each other and the third is different) or 0 (if all numbers are different).

Input: 10 5 10	Output: 2

Q3. Given a sequence of integer numbers ending with the number 0. Determine the length of the widest fragment where all the elements are equal to each other.

Input: 1 2 2 2 2 1 3 1 3 3 3 1 5 5 5 0	Output: 4

Note: 2 is repeated maximum times that is 4

Q4. Given a list of numbers, find and print the elements that appear in the list only once. The elements must be printed in the order in which they occur in the original list.

Input: 6 9 6 23 12 19 14 26	Output: 9 23 12 19 14 26

Note: Order of occurrence should be maintained.

Q5. Write a Python program to check the validity of password input by users. Validation:

- At least 1 letter between [a-z] and 1 letter between [A-Z].
- At least 1 number between [0-9].
- At least 1 character from [$#@].
- Minimum length 6 characters.
- Maximum length 16 characters.

Q6. A perfect number is a number for which the sum of its proper divisors is exactly equal to the number. For example, the sum of the proper divisors of 28 would be 1 + 2 + 4 + 7 + 14 = 28, which means that 28 is a perfect number. There are four perfect numbers less than 10,000. Write a program to find these four numbers.

Q7. Write the following function that merges two sorted lists into a new sorted list:

def merge(list1, list2): *Note: Don't use default functions*

Write a test program that prompts the user to enter two sorted lists and displays the merged list. Here is a sample run:

```
Enter List1:   1   5   16   61   111
Enter List2:    2  4    5    6
The merged list is:   1   2   4   5   5   6   16    61   111
```

Q8. A palindromic prime is a prime number that is also palindromic. For example, 131 is a prime and also a palindromic prime, as are 313 and 757. Write a program that displays the first 100 palindromic prime numbers. Display 10 numbers per line and align the numbers properly, as follows:

```
Sample Output:
  2     3     5     7    11  101  131  151  181  191
313  353  373  383  727  757  787  797  919  929
```

Q9. Write a program that prompts the user to enter the year and first day of the year, and displays the first day of each month in the year on the console. For example, if the user entered year 2013, and 2 for Tuesday, January 1, 2013, your program should display the following output:

```
Sample Output:
January 1, 2013 is Tuesday
...
December 1, 2013 is Sunday
```

Q10. Suppose the weekly hours for all employees are stored in a table. Each row records an employee's seven-day work hours with seven columns. For example, the following table stores the work hours for eight employees. Write a function that displays employees and their total hours in decreasing order of the total hours. The header of the function is:

def displayEmployee(record): *Note: The number of employees are not defined*

Write a test program that prompts the user to enter the employee record and displays it in decreasing order of the total hours.

Sample Employee record:

	Su	M	T	W	Th	F	Sa
Employee 0	2	4	3	4	5	8	8
Employee 1	7	3	4	3	3	4	4
Employee 2	3	3	4	3	3	2	2
Employee 3	9	3	4	7	3	4	1
Employee 4	3	5	4	3	6	3	8
Employee 5	3	4	4	6	3	4	4
Employee 6	3	7	4	8	3	8	4
Employee 7	6	3	5	9	2	7	9