# Green University of Bangladesh

## Department of Computer Science and Engineering

## CT3 (Assignment), Summer 2022

**Course Code: CSE 103** **Course Title: Structured Programming**

**Full Marks: 15**

*Sample questions are given below:*

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*[The [CO#] represents mapping of the question with one of the expected outcomes of the course.]*

1. Write a C program that takes a string as input and reverses each of the word without using built in function. [CO3]

| Sample Input | Sample Output |
|---|---|
| abc xyz | cba zyx |
| abc 123 | cba 321 |
| abx @#1 | xba 1#@ |

2. Write a C program that takes a string as input and finds the length of that string using recursive function. [CO3]

| Sample Input | Sample Output |
|---|---|
| abc xyz | 7 |
| abc 12 | 6 |
| abx@# | 5 |

3. Suppose you have some words and you want to right justify them, that is, align them to the right. Create a program that reads some words and print it all right justified, in the same order as they appear in the input. [CO3]

**Input:**
The first line of the input will contain an integer N ($1 \leq N \leq 50$) indicating the number of following words. Each word is composed of up to 50 letters (‘A’-‘Z’ or 'a'-'z') and will contain at least one letter.

**Output:**
Print the words padded on the left with space characters so that they are all the same length as the longest word found in that text.

| Sample Input | Sample Output |
|---|---|
| 3<br>Bob<br>Tommy<br>Jim | Bob<br>Tommy<br>Jim |
| 4<br>LONGEST<br>a<br>LONGER<br>SHORT | LONGEST<br>a<br>LONGER<br>SHORT |

4. Cyber Security is a key issue to protect our daily documents and applications stored and submitted in various platforms. Having a robust encryption system to our generated password is very essential in this perspective. Your task is to create a nice and smooth encrypted password generator. Follow the instructions carefully to build the password generator. [5 Marks] [CO3]

a. Take a 5 digit integer number from user. Use a function named Input_Number() to take the number from user. If the number is not exactly of 5 digits, give a warning message to user and exit/abort the program.

b. In case of a 5 digit number, pass each digit of the number to a user defined function named character_extractor() which would return a character corresponding to a digit. Character associated with each digit will be in the following sequence.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 |
|---|---|---|---|---|---|---|---|---|---|
| # | a | t | j | 9 | E | @ | 2 | F | ? |

c. Finally, pass your extracted characters in a user defined function named password_generator() to generate a 5 length password.

d. Show the password on screen.

Sample Input-Output:

| Input | Output |
|---|---|
| 287 | Wrong input |
| 9876543 | Wrong input |
| 12345 | #atj9 |
| 10207 | #?a?@ |
| 91778 | F#@@2 |

5. In programming terms a recursive function can be defined as a routine that calls itself directly or indirectly. Using recursive algorithm, certain problems can be solved quite easily. [CO3]
Write a program using recursive function that can convert a *Decimal* number to its equivalent *Binary* number.

| **Sample Input** | **Sample Output** |
|---|---|
| 3 | 11 |
| 5 | 101 |
| 11 | 1011 |

6. Write a program that will correctly decode a set of characters into a valid message. Your program should read a given **file** of a simple coded set of characters and print the exact message that the characters contain. The code key for this simple coding is a one for one character substitution based upon a single arithmetic manipulation of the printable portion of the ASCII character set. [CO3]

**Sample Input:**

1JKJ'pz'{ol'{yhklthyr'vm'{ol'Jvu{yvs'Kh{h'Jvywvyh{pvu5
1PIT'pz'h'{yhklthyr'vm'{ol'Pu{lyuh{pvuhs'I|zpulzz'Thjopul'Jvywvyh{pvu5
1KLJ'pz'{ol'{yhklthyr'vm'{ol'Kpnp{hs'Lx|pwtlu{'Jvywvyh{pvu5

**Sample Output:**

*CDC is the trademark of the Control Data Corporation.
*IBM is a trademark of the International Business Machine Corporation.
*DEC is the trademark of the Digital Equipment Corporation.