Lab Final Task **Course Title:** Microprocessors and Assembly Language Lab
Course ID: CSE - 4504

Date: 3 September (Friday), 2021 **Time:** 4:00 pm ~ 5:15 pm **Total Marks:** 25

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Instructions

a. Suppose, the last 2-digit of your student ID is **XX**. Now, using (XX MOD 22 = ?) derive a given **Problem Number** in between 0 to 21 and solve the respective problem as given below.

b. In a file named '***StudentId_problemNumber.asm'***, you have to write an Assembly Language program for a given individual problem to each of the students.

c. Total duration will be 1 Hour and 15 Minutes.

d. Total marks will be 25.

e. All the students have to submit their code, even it is not complete or unable to solve.

f. During exam, for any query post at the STREAM of respective google classroom.

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Problems

0. Write an assembly language program that will take an alphabet as an input (A~Z) or (a~z) and also take a given value N as input (0 to 9). Now, the output will show/display the N number character from the alphabet order starting from starting input alphabet (in the same case upper/lower as the given input).

   Sample Input / Output:
   Input Alphabet: B
   Given Value N: 3
   Output: E

1. Write an assembly language program that will accept an input string of 5 (five) letters in LOWERCASE from the keyboard and displays the string in reverse order in UPPERCASE in a new line.

   Sample Input / Output:
   Input: abcdef
   Output: FEDCBA

2. Write an assembly language program that will accept an input string of 5 (five) letters in UPPERCASE from the keyboard and displays the string in reverse order in LOWERCASE in a new line.

   Sample Input / Output:
   Input: ABCDEF
   Output: fedcba

3. Write an assembly language program that will accept an input digit N (0 to 9) from the keyboard and finds the even digits up to that input and displays those in new lines.

   Sample Input / Output:
   Input: 9
   Output: Even Digits: 0 2 4 6 8

4. Write an assembly language program that will accept an input digit N (0 to 9) from the keyboard and finds the odd digits up to that input and displays those in new lines.

   Sample Input / Output:
   Input: 9
   Output: Odd Digits: 1 3 5 7 9

5. Write an assembly language program that will accept an input of 5 (five) digits (0 to 9) from the keyboard randomly and rearrange them in ascending order.

   Sample Input / Output:
   Input: 2 4 5 3 2
   Output: Ascending: 2 2 3 4 5

6. Write an assembly language program that will accept an input of 5 (five) digits (0 to 9) from the keyboard randomly and rearrange them in descending order.

   Sample Input / Output:
   Input: 2 4 5 3 2
   Output: Descending: 5 4 3 2 2

7. Write an assembly language program that will accept an input of 5 (five) digits (0 to 9) from the keyboard randomly and sort-out the odd and even digits from them.

   Sample Input / Output:
   Input: 2 4 5 3 2
   Output: Odd: 3 5
   Even: 2 2 4

8. Write an assembly language program that will accept an input of 8 (eight) digits (0 to 9) from the keyboard randomly and sort-out the odd digits in ascending order.

   Sample Input / Output:
   Input: 2 4 7 5 6 1 8 3
   Output: Odd Ascending: 1 3 5 7

9. Write an assembly language program that will accept an input of 8 (eight) digits (0 to 9) from the keyboard randomly and sort-out the odd digits in descending order.

   Sample Input / Output:
   Input: 2 4 7 5 6 1 8 3
   Output: Odd Descending: 7 5 3 1

10. Write an assembly language program that will accept an input of 8 (eight) digits (0 to 9) from the keyboard randomly and sort-out the even digits in ascending order.

    Sample Input / Output:
    Input: 2 4 7 5 6 1 8 3
    Output: Even Ascending: 2 4 6 8

11. Write an assembly language program that will accept an input of 8 (eight) digits (0 to 9) from the keyboard randomly and sort-out the even digits in descending order.

    Sample Input / Output:
    Input: 2 4 7 5 6 1 8 3
    Output: Even Descending: 8 6 4 2

12. Write an assembly language program that will accept an input of 8 (eight) digits (0 to 9) from the keyboard randomly and finds the prime digits in ascending order.

    Sample Input / Output:

    Input: 2 4 7 5 6 1 8 3
    Output: Primes Digits Ascending: 2 3 5 7

13. Write an assembly language program that will accept an input of 8 (eight) digits (0 to 9) from the keyboard randomly and finds the prime digits in descending order.

    Sample Input / Output:

    Input: 2 4 7 5 6 1 8 3
    Output: Primes Digits Descending: 7 5 3 2

14. Write an assembly language program that will accept an input of 8 (eight) digits (0 to 9) from the keyboard randomly and sort-out the odd prime digits in ascending order.

    Sample Input / Output:
    Input: 2 4 7 5 6 1 8 3
    Output: Odd Primes Ascending: 3 5 7

15. Write an assembly language program that will accept an input of 8 (eight) digits (0 to 9) from the keyboard randomly and sorts them in ascending order.

    Sample Input / Output:
    Input: 2 4 3 5 6 1 8 3
    Output: 1 2 3 3 4 5 6 8

16. Write an assembly language program that will accept an input of 8 (eight) digits (0 to 9) from the keyboard randomly and sorts them in descending order.

    Sample Input / Output:
    Input: 2 4 3 5 6 1 8 3
    Output: 8 6 5 4 3 3 2 1

17. Write an assembly language program that will accept an input of 2 (two) digits (0 to 9) from the keyboard randomly and finds the *Greatest Common Divisor* of two digits.

    Sample Input / Output:

Input:	2 3	Input:	2 4
Output:	GCD: 1	Output:	GCD: 2

18. Write an assembly language program that will accept an input of 5 (five) digits (0 to 9) from the keyboard and finds the summation of the digits and displays the result in HEX digit.

    Sample Input / Output:

Input:	1 2 3 4 5
Output:	Sum: F

19. Write an assembly language program that will display an array inputted string “Islamic University of Technology” and it’s reverse string one after another for 10 times each (forward and reverse print) in total 20 (twenty times) in different lines with line feed..

20. Write an assembly language program that will display all the ASCII characters at REVERSE ORDER.

21. Write an assembly language program that will display only the ASCII characters of all DIGITS, ALPHABETS (upper and lower) at FORWARD and REVERSE ORDER (in different lines).