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C/C++ PROGRAMMING (IT116IU)

Lab 5 - Introduction to C/C++ Programming

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Due date: Please check on Blackboard

Instruction
Please follow the steps:
1. For each question, please make your code clean and make sure that your code is runnable.
2. Open the provided problem sets (.docx file). For each exercise, please capture screenshots of your work and then paste them into the problem sets (.docx file). DO NOT create a new answer file!
   Please convert this .docx file to .pdf file
3. Submit these files (source code and problem set files) to Blackboard before the deadline.
4. There are a total of 7 Lab Assignments in this course. 3/7 Lab Assignments will be randomly selected to score (~10% of your final score).
5. The final lab exam will be 10% of your final score.

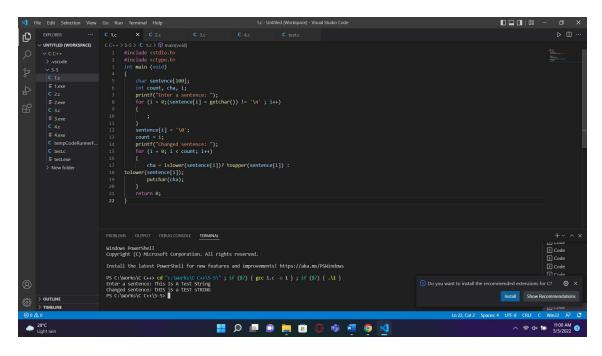<div align="center">

Lab Assignments

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Question 1. Write a program in C to read a sentence and replace lowercase characters by uppercase and vice-versa.
Hints: Use ctype.h library

Input: This Is A Test String.

Output: tHIS iS a tEST sTRING.

Question 2. Receive an array of all distinguished integers and a target, return indices of the two numbers such that they add up to a specific target.

Input:

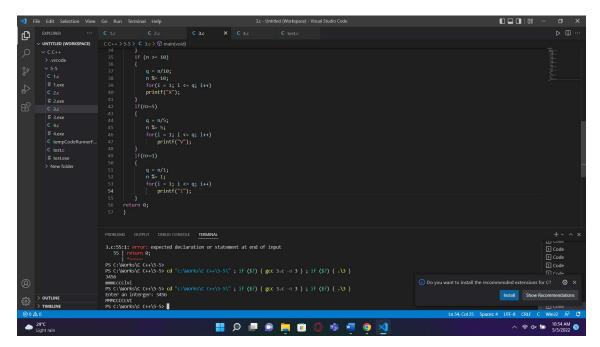2 7 11 15(array)

9 (target)

Output: [0 1]

Question 3. Given an integer, convert it to a roman number. Input must be within the range from 1 to 3999.

Input: 3456

Output: MMMCDLVI

Decimal Number	Roman Numeral
1	I
4	IV
5	V
9	IX
10	X
40	XL
50	L
90	XC
100	C
400	CD
500	D
900	CM
1000	M

Question 4. (Airline Reservations System) A small airline has just purchased a computer for its new automated reservations system. The president has asked you to program the new system. You are to write a program to assign seats on each flight of the airline's only plane (capacity: 10 seats).

Your program should display the following menu of alternatives:

Please type 1 for "first class"

Please type 2 for "economy"

If the person types 1, then your program should assign a seat in the first class section (seats 1-5). If the person types 2, then your program should assign a seat in the economy section (seats 6-10). Your program should then print a boarding pass indicating the person's seat number and whether it is in the first class or economy section of the plane.

Use a single-subscripted array to represent the seating chart of the plane. Initialize all the elements of the array to 0 to indicate that all seats are empty. As each seat is assigned, set the corresponding elements of the array to 1 to indicate that the seat is no longer available.

Your program should, of course, never assign a seat that has already been assigned. When the first class section is full, your program should ask the person if it is acceptable to be placed in the economy section (and vice versa). If yes, then make the appropriate seat assignment. If no, then print the message "Next flight leaves in 3 hours."

```
Please type 1 for "first class"
Please type 2 for "economy"
? 2
Your seat assignment is 6

Please type 1 for "first class"
Please type 2 for "economy"
? 1
Your seat assignment is 1

Please type 1 for "first class"
Please type 2 for "economy"
? 2
Your seat assignment is 7
.
.
.
Please type 1 for "first class"
Please type 2 for "economy"
? 1
The first class section is full.
Would you like to sit in the economy section ( Y or N )? n
Next flight leaves in 3 hours.

Please type 1 for "first class"
Please type 2 for "economy"
? 1
The first class section is full.
Would you like to sit in the economy section ( Y or N )? y
Your seat assignment is 9

Please type 1 for "first class"
Please type 2 for "economy"
? 2
Your seat assignment is 10

All seats for this flight are sold.
```

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