**National University of Computer and Emerging Sciences**



**Lab Manual 03**

**Object Oriented Programming**

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## Objectives

After performing this lab, students shall be able to:

* Solve Problems with least amount of memory allocation.
* Learn how to declare and initialize dynamic 2d arrays.
* Traverse and manipulate dynamic 2d arrays with variable columns and rows.
* CString operations

**TASK 1: Dynamic 2D Arrays:**

Q:1 Given 3 sets of integer A, B and C with equal length; you are required to compute A∩B, B∩C and C∩A. The intersection results should be stored in a 2d integer array such that A∩B is in row 0, B∩C is in row 1, and C∩A is in row2 of the resultant array.  
Keeping in mind that the intersection results might vary in lengths, you have to make sure that no row should have empty columns.  
You’ll need the following functions to do the job:

1. Input the three integer Sets
2. Calculate Intersection and return the resultant array
3. Output the resultant 2d array

**For Example:**

A={1,2,3,4,5,6,7,8,9,10}

B={1,2,5,6,9,10,13,14,18,20}

C={2,4,6,8,10,11,13,15,17,19}

**Resultant array:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1 | 2 | 5 | 6 | 9 | 10 |
| 2 | 6 | 10 | 13 |  |  |
| 2 | 4 | 6 | 8 | 10 |  |

**TASK 2: CStrings**

Q1: Implement the following string functions, the functions would be your version to the built-in CString library functions “strcat()” (String concatenation), and ”strcopy()” (String copy)

1. Implement a function strcopy such that it takes two arguments i.e., pointer to a C-string where the contents are copied to pointer to a C-string where the contents are copied from. The strcopy() function returns: str1 (the pointer to the destination C-string). prototype of strcopy is char\* strcopy(char \* str1, char\* str2)2.
2. Implement a function char\* strconcatenate(char\* str1 , char\* str2) that will take two strings as argument, this will append the contents of str2 at the end of str1 and return str1.

Q2: Write a program to ask the user for a string and then checks where it is a palindrome or not.

A palindrome is a word, number, phrase, or other sequence of characters which reads the same backward as forward, such as madam, noon, radar etc.