National University

Of Computer & Emerging Sciences Chiniot - Faisalabad Campus

CL-1002
Programming Fundamentals - Lab
Lab # 12

Objectives:

- Conditional statements.
- Switch case
- Loops – Basics
- Nested Loops
- 1D arrays
- 2D arrays
- Practice tasks

Note: Carefully read the following instructions (*Each instruction contains a weightage*)

1. Use proper **font family** and **font size** of **heading**, **sub heading** and **normal text**.
2. First think about statement problem then write/draw your logic on copy.
3. Attach the screen shots of your code in word file with execution (cpp project).
4. File (Word) tittle should in proper format (**23F-1001-Lab2**)
5. You have to submit both (**word + Project in zip/archive**) files.
6. **Upload separate word file and archive/zip of your project.**
7. **50% marks would be deducted on wrong formatting.**
8. **No submission will be accepted after deadline.**
9. Do not copy from any source otherwise you will be penalized with negative marks.
10. Complete your lab **within given Time Slot**.

Sample Codes:

```
#include <iostream>
using namespace std;

int main() {

for (int i = 1; i <= 5 ; ++i)
{
        for (int j = 1; j <= 5; ++j)
        cout << "*";
        cout << endl;
}

system("pause");
return 0;
}
```

```
#include <iostream>
using namespace std;
```

```
int main() {

for (int i = 1; i <= 5 ; ++i)
{
        for (int j = 1; j <= i; ++j)
        cout << "*";
        cout << endl;
}
system("pause");
return 0;
     }
```

```
#include <iostream>
using namespace std;

int main() {


for (int i = 5; i >= 1 ; i--)
        {
                for (int j = 1; j <= i; ++j)
                        cout << "*";
                cout << endl;
        }
system("pause");
return 0;
}
```

```
#include <iostream>
using namespace std;

int main()

for ( int i = 1; i <= 5; i++)
{
        for( int j = 1; j <= 10; j++)
                cout << setw(3) << i * j ;
        cout << endl ;
}
system("pause");
return 0;
}
```

Problem: Write C++ code for the following statements

1. Write a program to convert the time from 24-hour notation to 12-hour notation and vice versa. Your program must be menu driven, giving the user the choice of converting the time between the two notations. Furthermore, your program must contain at least the following options: converts the time from 24-hour notation to 12-hour notation, converts the time from 12-hour notation to 24-hour notation, displays the choices, to get the input, and to display the results. (For 12-hour time notation, your program must display A or P). Marks (5)

2. Write a C++ program that declares an array alpha of 50 components of type double. Initialize the array so that the first 25 components are equal to the square of the index variable, and the last 25 components are equal to same values as first 25. Output the array so that 10

elements per line are printed. Marks (5)

3. Write a C++ code that creates the 1D array of size 10 with integer values, input values, and displays the above average values and also below average values. Marks (10)

   Mean = average. Sum of all values / # of elements

4. Write a C++ array that creates two integer arrays of same size. Input values in first array and assign half values of first array to second array in reverse order remain half assigns the same. Display both arrays. Marks (5)

   Array1: 10 20 30 40 50 60

   Array2: 30 20 10 40 50 60

5. Write a C++ code that create two 2-D arrays of size 2*2 and input values from user. Now your program asks user to add operator (* or /) and perform that operation on both arrays and save result in another array. If denominator is zero apply assert. Marks (10)

   | 2 5 | * | 6 1 | | 12 5 |

   | 4 3 | | 2 7 | | 8 21|

6. Write a C++ code that take 3*3 array as input and check whether it is symmetric or not. And also replace diagonal values with zero. Here are some examples of symmetric array/matrix: Marks (20)

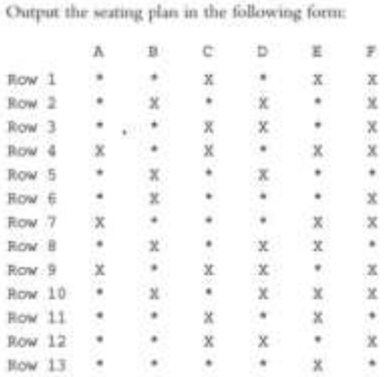
   | 4 99 42 | | 12 65 4 |

   | 99 25 19 | | 65 88 7 |

   | 42 19 12 | | 4 7 6 |

7. Write a program that can be used to assign seats for a commercial airplane. The airplane has 13 rows, with six seats in each row. Your program must prompt the user to enter the following information: Marks (15)

   1. Desire seat Number



Output the seating plan in the following form:

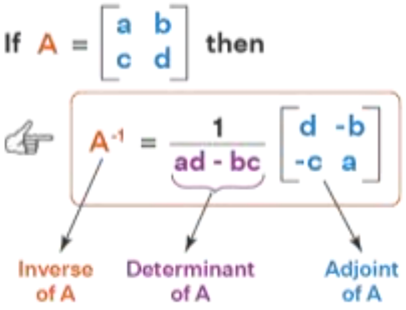
```
            A     B     C     D     E     F

Row  1      *     *     X     *     X     X
Row  2      *     X     *     X     *     X
Row  3      *     *     X     X     *     X
Row  4      X     *     X     *     X     X
Row  5      *     X     *     X     *     *
Row  6      *     X     *     *     *     X
Row  7      X     *     *     *     X     X
Row  8      *     X     *     X     X     *
Row  9      X     *     X     X     *     X
Row 10      *     X     *     X     X     X
Row 11      *     *     X     *     X     *
Row 12      *     *     X     X     *     X
Row 13      *     *     *     *     X     *
```

Here, * indicates that the seat is available; X indicates that the seat is occupied. Make this a menu driven program; show the user's choices and allow the user to make the appropriate choices.

Note: If seat already occupy show the proper message and then say choice again, and need to do all other exception handlings.

8. Write a C++ code that take 2*2 matrix as an input and calculate its inverse.   Marks (25)



Note: A^{-1} exists only when $ad - bc \neq 0$

~~Note: Calculate inverse of 3*3 matrix (Bonus – 50 Marks)~~

Best of Luck ☺

! false – *It's funny because it's true.*