

**Programming Assignment 1**  
**Due Date : Wednesday February 3<sup>rd</sup> – 2021**  
**Section 252 : 3:45 pm and Section 253 @ 2:15 pm**

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Write a C++ program that uses a **2 D array** to store a set of random numbers into 5 by 5 dimensional array. The numbers that are stored in the array must be between 1 and 100. Use random number generator in order to generate the random numbers. The program then outputs the numbers, sum, smallest, largest, average, prime of the numbers, and the sorted array.

## Sample Output

This Program is Written by Your First Name Your Last Name

The program uses a 5 by 5 array to store a set of random numbers into array. The numbers are between 1 and 100. The program then displays on the screen the numbers, sum, average, smallest, largest, even, odd, and prime of the numbers. Finally, the program will display the array with the numbers are sorted from lowest to highest.

The size of the array is = 5

The 5 x 5 array is

34	44	63	30	1
19	53	87	57	20
12	52	40	6	9
94	31	67	70	33
18	48	73	69	81

The Sum is :

The Average is :

The Smallest is :

The Largest is :

Even Numbers are :

Odd Numbers are :

All prime numbers are :

The Array after Sort :

Prepared by : Your First Name followed by your Last Name

February 3 , 2021

**Note :**

**In main :**

- Define the 5 x 5 array.
- Pass the array to each of the following functions :
  1. Populating the array with random numbers
  2. Displaying the array , sum , average , smallest , largest , even , and odd numbers
  3. Find and display all prime numbers in the array
  4. Sort and display the sorted array.

## **Style Guidelines :**

At the beginning of your program ( and **before** the #include statement ), include the following :

**Header comments** (file documentation block) should be at the top of each file and should contain: Author / s, Due Date, Assignment Number, Course number and section, Instructor, and a brief description of the purpose of the code in the file. For example :

```
// Author : (Your name here!!)
// Due Date :
// Programming Assignment Number 1
// Spring 2021 - CS 3358 - Section Number
//
// Instructor: Husain Gholoom.
//
// <Brief description of the purpose of the program>
```

### **Variable names :**

- Must be meaningful.
- The initial letter should be lowercase, following words should be capitalized, no other caps or punctuation ( i.e. `weightInPounds` ).
- Each variable must be declared on a separate line with a descriptive comment.

## Named constants :

- Use for most numeric literals.
- All capitals with underscores ( i.e. `TX_STATE_SALES_TAX` )
- Should occur at top of function, or global (only if necessary)

**Line length** of source code should be no longer than 80 characters (no wrapping of lines).

## Indentation :

- Use 2-4 spaces (but be consistent throughout your program).
- Indent blocks, within blocks, etc.
- Use blank lines to separate sections.

## Comments for variables :

All variable definitions should be commented as follows:

```
int  gender;    // integer value for the gender,
                // 1 = Male , 2 = Female ,
```

## **Rules :**

1. Your program **must compile** and run using latest version of code::blocks under windows ( 20.03) .
2. Your program must be **documented according the style above . See the website for the sample programming style program.**
3. You must use the appropriate libraries in writing this program. However, you are **not** allowed to use the sort library.
4. Must used at least 4 functions ( function prototypes and definitions ).
5. Not allowed to use global Arrays , global variables .
6. Must properly format the output as it is shown on the sample run below.  
Replace my name with your name
7. You must name your program as :

- SP21\_3358\_S#\_LastName\_FirstName\_PG1.cpp

**Where LastName is your Last Name and FirstName is your First Name, and S# is your section number. For example , the file name should look something like :**

**SP21\_3358\_252\_Gholoom\_Husain\_PG1.cpp ( **not .cbp** ) or  
SP21\_3358\_253\_Gholoom\_Husain\_PG1.cpp**

8. You must upload your programs no later than the starting of class time on the due date. **No late assignments will be accepted**

**Use Canvas To upload your program.**

**The following points will be deducted if :**

- Incorrect file format such as uploading .cbp instead of .cpp , missing electronic copy , compilation Errors , using the sort library **( - 10 points )**
- Compilation Errors , using the sort library , using global arrays , using global variables **( - 7.5 points )**
- Other **( at least 0.5 point each )** :
  - Logical Errors
  - Not using at least 4 functions
  - Incorrect program file name.
  - Incorrect output format.
  - Incorrect Style **such as but not limited to** Missing output header , output footer , comments or program documentations, missing section number, missing function prototypes ... etc