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**Assignement-VI**  
**National Institute of Technology Silchar**  
**Due date: 04 January 2023**

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Subject Code: CS-101  
Semester: 1<sup>st</sup>  
Course: B.Tech

Subject: Introduction to Computer Programming  
Department: CSE  
Section: J

*Answers should be submitted in a scanned copy of the handwritten format. Also, submit the source code of the corresponding questions in your github link.*

***Write functions for all questions given below.***

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1. Write a program to generate prime numbers using the Sieve of Eratosthenes method.
2. Write a program to generate a random one-time password of eight characters long. The password should contain at least one small letter, one capital letter, one symbol, and one digit.
3. Given two array  $X[2][n]$  and  $Y[2][n]$  containing random numbers, i.e., 2 rows and  $n$  columns. Write a program to solve the following equation-

$$\frac{1}{n} \sum_{i=0}^{(n-1)} \sqrt{(X_{1i} - X_{0i})^2 - (Y_{1i} - Y_{0i})^2}$$

Hints:  $X_{0i}$  means  $X[0][i]$  in C programming. Initialization of the array is as given below-

```
//#include "random.h"
for (i=0;i<n;i++)
{
    X[0][i]=random32();
    X[1][i]=random32();
    Y[0][i]=random32();
    Y[1][i]=random32();
}
```

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4. Given an array  $A[]$  containing  $n$  random numbers. Write a program to find the mean, variance, and standard deviation of the given array.

The mean is defined as

$$\mu = \sum_{i=0}^{(n-1)} A_i$$

The variance is defined as

$$\sigma^2 = \frac{1}{n} \sum_{i=0}^{(n-1)} (A_i - \mu)^2$$

The standard deviation is defined as

$$\sigma = \sqrt{\frac{1}{n} \sum_{i=0}^{(n-1)} (A_i - \mu)^2}$$

Hints: Initialize the array using random numbers as follows-

```
//#include "random.h"
for ( i=0; i<n; i++)
    A[ i]=random32 ( );
```