**Student Name:-**

**Student Roll No.:-**

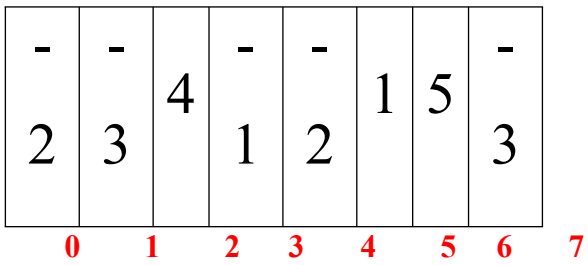
**Algorithm Lab. Class Assignment**

**CSE Group 5**

**Date: - 23th August 2023**

1. **Write a C program to find the sum of contiguous sub-array within a one dimensional (1-D) array of numbers which has the largest sum. Find the time complexity of your program.**

**Example**




**4 + (-1) + (-2) + 1 + 5 = 7**

**So the maximum contiguous sub-array sum is 7**

**Program**

**Output**

2. **Write a program to find out the largest difference between two elements A[i] and A[j] ( A[j]-A[i]) of the array of integers A in O(n) time such that j > i. For example: Let A is an array of integers:**

**int[] a = { 10, 3, 6, 8, 9, 4, 3 };**

**if i=1, j=3, then diff = a[j] – a[i] = 8 – 3 = 5**

**if i=4, j=6, then diff = a[j] – a[i] = 3 – 9 = -6**

**……**

**……**

**if i=1, j=4, then diff = a[j] – a[i] = 9 – 3 = 6**

**……**

**……**

**6 is the largest number between all the differences, that is the answer.**

**Find the time complexity of your program.**

**Program**

**Output**

**3. Find the GCD and LCM of n numbers where (n>=2).**

**Program**

**Output**

**4. Consider an n × n matrix A = ($a_{ij}$), each of whose elements $a_{ij}$ is a non-negative real number, and suppose that each row and column of A sums to an integer value. We wish to replace each element $a_{ij}$ with either ⌉ $a_{ij}$ ⌉ or ⌋ $a_{ij}$ ⌋ without disturbing the row and column sums. Here is an example:**

$$\begin{pmatrix} 10.9 & 2.5 & 1.3 & 9.3 \\ 3.8 & 9.2 & 2.2 & 11.8 \\ 7.9 & 5.2 & 7.3 & 0.6 \\ 3.4 & 13.1 & 1.2 & 6.3 \end{pmatrix} \rightarrow \begin{pmatrix} 11 & 3 & 1 & 9 \\ 4 & 9 & 2 & 12 \\ 7 & 5 & 8 & 1 \\ 4 & 13 & 2 & 6 \end{pmatrix}$$

**Write a program by defining an user defined function that is used to produce the rounded matrix as described in the above example. Find out the time complexity of your algorithm/function.**

**Program**

## Output