



المادة: Introduction To Programming	المرحلة: الاجزة
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### Question 1 Array of integers

1.1) Write a C++ program that declares an array of integers A[7] and initialized it with the following values:

$$A = \begin{bmatrix} -2 & 8 & 4 & -10 & 1 & 5 & 3 \end{bmatrix}$$

1.2) Write a C++ program that changes to zero the elements of the array A having an even index using a loop. The array A becomes:

$$A = \begin{bmatrix} 0 & 8 & 0 & -10 & 0 & 5 & 0 \end{bmatrix}$$

1.3) Write a C++ program that sums the positive elements of A using a loop and displays the result.

### Question 2 (functions) The two following parts are independent

2.1) define a function `int sumCube(int n)` that calculates the summation of the cube of all the integers from 0 to n and returns the result.

Example: let  $n = 3$ ,  $\text{sumCube}(3) = 0^3 + 1^3 + 2^3 + 3^3 = 36$ .

2.2) give the output of the main program:

```
#include <iostream>
using namespace std;
int f(int a=0, int b=1, int c=3)
{ int s = c;
  int i;
  for(i=a; i<=b; i++)
  s += i*i;
  return s;
}
int main()
{ cout << f() << endl;
  cout << f(5, 1, 5) << endl;
  cout << f(-1, 3, 2) << endl;
  cout << f(2, 4);
  return 0;
}
```

### Question 3 Matrix

3.1) Write a C program that initializes an integer matrix T[4][4] with the values given below:

$$T = \begin{pmatrix} 2 & 4 & 6 & 1 \\ 9 & 0 & 10 & 8 \\ 6 & 1 & 12 & 3 \\ 3 & 0 & 11 & 7 \end{pmatrix} \rightarrow$$

3.2) Write a C program that counts the number of elements of T below the diagonal that are greater than or equal to 6. The program will print 3 since we have 9, 6, and 11 in T.

3.3) Write a C program that displays only odd rows of T using two loops. The program will display:

```
9 0 10 8 ↙
```

```
3 0 11 7 ↙
```