21CSC201T – Object Oriented Design and Programming

Week - 2 – Tutorial Questions

Pointers, Arrays and Type Conversion

1. Write a menu driven C++ program with following option
   a. Insert an element – Add a new integer to the array (at the next available position).
   b. Delete an element – Remove a specific integer from the array (if it exists).
   c. Search for an element – Check if a given integer is present in the array.
   d. Display all elements – Print all stored integers in the array.
   e. Sort the array – Sort the array in ascending order.
   f. Exit – Terminate the program.

2. Develop a system to manage students' marks in a class. The C++ program should:
   - Use an array to store marks of N students.
   - Provide a menu-driven system with options to:
     a. Enter marks of N students.
     b. Calculate the average marks of the class.
     c. Find the highest and lowest marks.
     d. Exit.

3. Write a C++ program that reverses an integer array using pointers. The program should:
   - Accept N integers from the user and store them in an array.
   - Use a pointer approach to swap elements in place (without using another array).
   - Display the original and reversed arrays.

4. What is the data type of ‘result’ in the below code? Justify your answer based on C++'s type conversion rules.

```
float x = 2.5;
int y = 3;
auto result = x / y;
```

5. Consider this code snippet:

```
double pi = 3.14159;
int approx_pi = (int)pi + 0.5;
std::cout << approx_pi;
```

What is the expected output? How would you modify the code to ensure correct rounding to the nearest integer?