# SWT11022: Practical for Fundamentals of Programming

**Department of Information & Communication Technology**
**Faculty of Technology**
**South Eastern University of Sri Lanka**

Time: - 10.30am - 12.30 pm Lab sheet 13

**Title: Introduction to Pointers-II**

**Objective:**

- Learn to access array elements using pointers.
- Understand pointers as function parameters.

## Pointers with Functions

Passing a variable by pointer allows the function to modify the original value.

```
void update(int *x) {
    *x = 100;
}

int main() {
    int a = 5;
    update(&a);  // pass address of a
    printf("%d", a);  // prints 100
}
```

Example: Swap Two Numbers Using Pointers

```c
#include <stdio.h>

// Function to swap values using pointers
void swap(int *a, int *b) {
    int temp;
    temp = *a;    // store the value of a
    *a = *b;      // assign value of b to a
    *b = temp;    // assign stored value of a to b
}

int main() {
    int num1 = 10, num2 = 20;

    printf("Before swapping:\n");
    printf("num1 = %d, num2 = %d\n", num1, num2);

    // Call swap function and pass addresses of num1 and num2
    swap(&num1, &num2);

    printf("\nAfter swapping:\n");
    printf("num1 = %d, num2 = %d\n", num1, num2);

    return 0;
}
```

**Exercise 01:**

Step 1: Write a C program for a 2D array with the following values:

| |
|---|
| 34 81 96 |
| 72 48 24 |
| 80 10 71 |

Step 2: Declare and initialize a pointer to refer to the 2D array.

Step 3: Print the address of the array using the pointer.

Step 4: Use pointers to print the address of each row.

Step 5: Print the address of each element using for loops by referencing the elements with pointers.

Step 6: Dereference the pointers to print the elements of the array.

Step 7: Use pointers to sum all the elements in the array and print the result.

**Exercise 02:**

Step 1: Write a C program to accept integers as an array.

Step 2: Sort the array elements.

Step 3: Print the sorted array elements.

Use Functions: Call functions by reference to complete the tasks.

**Exercise 03:**

Write a C program with a function called findMaxMin() that takes two integer numbers and finds the maximum and minimum among them using pointers. The result should be stored in the variables passed to the function through pointers.

**Discussion:**

- Discuss the relationship between pointers and arrays.
- Understand the concept of function pointers.
- Learn about memory access and debugging techniques using pointer.

**Report Submission Guidelines**

- Submit the Report by **14/05/2025.**
- Late submissions will not be accepted.
- Report Structure
    - Practical No
    - Date of Submission
    - Title
    - Objective of the practical.
    - Exercise
    - Challenges
    - Discussion
    - References