Assignment 1: Selection Sort

Objective:
To understand and implement Selection Sort using C programming with clear explanation, input, and output.

Theory:
Selection Sort is a simple comparison-based sorting algorithm. It works by repeatedly selecting the smallest element from the unsorted portion of the array and swapping it with the first unsorted element.

Algorithm:

1. Start from the first element of the array.
2. Find the minimum element in the unsorted part.
3. Swap it with the element at the current position.
4. Move to the next position.
5. Repeat until the array is sorted.

C Program:

```
#include <stdio.h>

int main() {
        int arr[5] = {64, 25, 12, 22, 11};
        int i, j, min, temp;

        for (i = 0; i < 4; i++) {
        min = i;
        for (j = i + 1; j < 5; j++) {
        if (arr[j] < arr[min])
                min = j;
        }
        temp = arr[i];
        arr[i] = arr[min];
        arr[min] = temp;
        }
```

```
        printf("Sorted Array:\n");
        for (i = 0; i < 5; i++)
        printf("%d ", arr[i]);

        return 0;
}
```

Input:

64 25 12 22 11

Output:

11 12 22 25 64

Conclusion:

Selection Sort is easy to understand but inefficient for large datasets due to its $O(n^2)$ time complexity.