Institute of Computer Technology

B. Tech. Computer Science and Engineering

Sub: DS

Course Code: 2CSE302

Practical – 20

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Sem - 3

Branch: CS

Class: A

Batch: 32

Selection Sort is a sorting algorithm that repeatedly finds the smallest element from the unsorted portion of a list and moves it to the beginning. This process is repeated for each position in the list until it is fully sorted.

Code:

```c
#include <stdio.h>

void selectionSort(int arr[], int n) {
    int i, j, minIndex, temp;

    printf("Initial Array:\n");
    for (i = 0; i < n; i++) {
        printf("%d ", arr[i]);
    }
    printf("\n");

    // Selection Sort Algorithm
    for (i = 0; i < n - 1; i++) {
        minIndex = i; // Assume the first unsorted element is the smallest

        for (j = i + 1; j < n; j++) {
            if (arr[j] < arr[minIndex]) {
                minIndex = j; // Update the index of the smallest element
```

```
            }
        }

        // Swap the smallest element with the first unsorted element
        if (minIndex != i) {
            temp = arr[i];
            arr[i] = arr[minIndex];
            arr[minIndex] = temp;
        }

        // Print the array after each step
        printf("Step %d:\n", i + 1);
        for (j = 0; j < n; j++) {
            printf("%d ", arr[j]);
        }
        printf("\n");
    }

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

int main() {
    int arr[] = {29, 10, 14, 37, 13};
    int n = sizeof(arr) / sizeof(arr[0]);

    selectionSort(arr, n);

    return 0;
}
```

Output:

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS  SERIAL MONITOR  COMMENTS

PS C:\ICT\SEM-3\DS\Practical> cd 'c:\ICT\SEM-3\DS\Practical\Practical-20\output'
PS C:\ICT\SEM-3\DS\Practical\Practical-20\output> & .\'main.exe'
Initial Array:
29 10 14 37 13
Step 1:
10 29 14 37 13
Step 2:
10 13 14 37 29
Step 3:
10 13 14 37 29
Step 4:
10 13 14 29 37
Sorted Array:
10 13 14 29 37
PS C:\ICT\SEM-3\DS\Practical\Practical-20\output>
```