

D Y Patil International University
School of Computer Science, Engineering and Applications

Academic Year 2023-2024

Practical Assignment No. 1

Class: S. Y. B. Tech. SEM III
algorithm

Subject: (CSE 301) Design and Analysis of

Topic- Linear sorting algorithms

Name :Nachiket Deshpande PRN :20220802357

- Write a C code to implement bubble sort algorithm.

```
1  #include <stdio.h>
2
3  void bubble_sort(int arr[], int n) {
4      int i, j;
5      for (i = 0; i < n - 1; i++) {
6          for (j = 0; j < n - i - 1; j++) {
7              if (arr[j] > arr[j + 1]) {
8                  int temp = arr[j];
9                  arr[j] = arr[j + 1];
10                 arr[j + 1] = temp;
11             }
12         }
13     }
14 }
15
16 int main() {
17     int arr[] = {64, 34, 25, 12, 22, 11, 90};
18     int n = sizeof(arr) / sizeof(arr[0]);
19     bubble_sort(arr, n);
20     printf("Sorted array: ");
21     for (int i = 0; i < n; i++) {
22         printf("%d ", arr[i]);
23     }
24     return 0;
25 }
```

Sorted array: 11 12 22 25 34 64 90

...Program finished with exit code 0
Press ENTER to exit console. □

Write a C code to implement insertion sort algorithm.

```
2  #include <math.h>
3  #include <stdio.h>
4  void insertionSort(int arr[], int n)
5  {
6      int i, key, j;
7      for (i = 1; i < n; i++) {
8          key = arr[i];
9          j = i - 1;
10         while (j >= 0 && arr[j] > key) {
11             arr[j + 1] = arr[j];
12             j = j - 1;
13         }
14         arr[j + 1] = key;
15     }
16 }
17 void printArray(int arr[], int n)
18 {
19     int i;
20     for (i = 0; i < n; i++)
21         printf("%d ", arr[i]);
22     printf("\n");
23 }
24 int main()
25 {
26     int arr[] = { 12, 11, 13, 5, 6 };
27     int n = sizeof(arr) / sizeof(arr[0]);
28     insertionSort(arr, n);
29     printArray(arr, n);
30     return 0;
31 }
32
```

5 6 11 12 13

C code implement selection sort algorithm.

```
1 // Selection sort in C
2 #include <stdio.h>
3 void swap(int *a, int *b) {
4     int temp = *a;
5     *a = *b;
6     *b = temp;
7 }
8 void selectionSort(int array[], int size) {
9     for (int step = 0; step < size - 1; step++) {
10         int min_idx = step;
11         for (int i = step + 1; i < size; i++) {
12             if (array[i] < array[min_idx])
13                 min_idx = i;
14         }
15         swap(&array[min_idx], &array[step]);
16     }
17 }
18 void printArray(int array[], int size) {
19     for (int i = 0; i < size; ++i) {
20         printf("%d ", array[i]);
21     }
22     printf("\n");
23 }
24 int main() {
25     int data[] = {20, 12, 10, 15, 2};
26     int size = sizeof(data) / sizeof(data[0]);
27     selectionSort(data, size);
28     printf("Sorted array in Ascending Order:\n");
29     printArray(data, size);
30 }
```