DATA STRUCTURES AND ALOGRITHM

Saravanakaruppu. K

Batch one

Question: write the function for insertion sort.

Insertion sort is a simple sorting algorithm that works similar to the way you sort playing cards in your hands. The array is virtually split into a sorted and an unsorted part. Values from the unsorted part are picked and placed at the correct position in the sorted part.

Algorithm

To sort an array of size n in ascending order:

1: Iterate from arr[1] to arr[n] over the array.

2: Compare the current element (key) to its predecessor.

3: If the key element is smaller than its predecessor, compare it to the elements before. Move the greater elements one position up to make space for the swapped element.

Function:

// C++ program for insertion sort

#include <bits/stdc++.h>

Using namespace std;

/\* Function to sort an array using insertion sort\*/

Void insertionSort(int arr[], int n)

{

Int I, key, j;

For (I = 1; I < n; i++)

{

Key = arr[i];

J = I – 1;

/\* Move elements of arr[0..i-1], that are

Greater than key, to one position ahead

Of their current position \*/

While (j >= 0 && arr[j] > key)

{

Arr[j + 1] = arr[j];

J = j – 1;

}

Arr[j + 1] = key;

}

}

// A utility function to print an array of size n

Void printArray(int arr[], int n)

{

Int I;

For (I = 0; I < n; i++)

Cout << arr[i] << “ “;

Cout << endl;

}

/\* Driver code \*/

Int main()

{

Int arr[] = { 12, 11, 13, 5, 6 };

Int n = sizeof(arr) / sizeof(arr[0]);

insertionSort(arr, n);

printArray(arr, n);

return 0;

}