Part A

Ex : 1

Title: Write a program in C to create a data structure which can handle varying number of entries and sort it.

Problem Description: Need to create a data structure which makes use of memory dynamically. The sorting can be done using any technique.

Method: The method utilized here is the use of dynamic memory allocation functions and define a function to perform selection sort.

Theory Reference: Module 1

Explanation:

1. **Dynamic Memory Allocation**:
    - The array **a** is dynamically allocated using malloc(). The size of the array is determined at runtime based on user input.
2. **Selection Sort**:
    - The selectionSort function sorts the array by repeatedly finding the minimum element from the unsorted part and swapping it with the first element of the unsorted part.
3. **Freeing Memory**:
    - After sorting, the dynamically allocated memory is freed using free() to avoid memory leaks.

Algorithm

Step 1: start

Step 2: First, we will select the range of the unsorted array using a loop (say i) that indicates the starting index of the range. The loop will run forward from 0 to n-1. Set pos to location i (i=0 initially).

Step 3: Search the minimum element in the list.

Step 4: Swap with value at location pos (if i!=pos)

Step 5: Repeat steps 3,4 by Increment pos to point to next element till n-1 until the list is sorted.

Step 6: Stop.