PIMPRI CHINCHWAD EDUCATION TRUST's.

PIMPRI CHINCHWAD COLLEGE OF ENGINEERING

(An Autonomous Institute)

Class : SY BTech **Acad. Yr. 2025-26** **Semester : I**

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Department: Computer Engineering **Division : A**

Course Name : Data Structures Laboratory **Code:BCE23PC02**

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Assignment No.

Problem Statement:

Quick sort A warehouse management system wants to sort inventory items by stock quantity to prioritize restocking. Write a program for above scenario.

Hint:

Given an unsorted list of inventory quantities, implement Quick Sort to sort items by stock quantity in ascending order. Discuss how the presence of many duplicate quantities affects Quick Sort's efficiency.

Source Code :

```
#include <bits/stdc++.h>
using namespace std;

// partition and sort
int partition(vector<int> &arr, int low, int high)
{
   int pivot = arr[high];
   int i = low - 1;

   for (int j = low; j < high; j++)
   {
      if (arr[j] <= pivot)
      {
         i++;
         swap(arr[i], arr[j]);
      }
   }
```

```
    swap(arr[i + 1], arr[high]);
    return i + 1;
}

// quick sort
void quickSort(vector<int> &arr, int low, int high)
{
    if (low < high)
    {
        int pi = partition(arr, low, high);
        quickSort(arr, low, pi - 1);
        quickSort(arr, pi + 1, high);
    }
}

int main()
{
    vector<int> q;
    int n;

    cout << "Enter number of inventory items: ";
    cin >> n;

    cout << "Enter stock quantities:\n";
    for (int i = 0; i < n; i++)
    {
        int temp;
        cin >> temp;
        q.push_back(temp);
    }

    quickSort(q, 0, n - 1);

    cout << "\nSorted stock quantities (Ascending):\n";
    for (int i = 0; i < q.size(); i++)
    {
        cout << q[i] << " ";
    }
    cout << endl;

    return 0;
}
```

Screen Shot of Output :

```
Enter number of transactions: 3
Enter transaction amounts :
10000
50000
2500

Sorted transactions :
2500 10000 50000
```

Conclusion: Hence we have implemented a warehouse management system wants to sort inventory items by stock quantity