PRN No. : 124B2B012

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Title: Consider Employee database of PCCOE (at least 20 records). Database contains different fields of every employee like EMP-ID, EMP-Name and EMP-Salary.

a. Arrange list of employees according to EMP-ID in ascending order using Quick Sort.

b. Arrange list of Employee alphabetically using Merge Sort.

Code:

a)

```
#include<iostream>
#include<string>

class emp
{
    public:
    int id;
    int salary;
    std::string name;

    void read()
    {
        std::cout<<"Enter id:";
        std::cin>>id;
        std::cout<<"Enter name:";
        std::cin>>name;
        std::cout<<"Enter salary:";
        std::cin>>salary;
    }
```

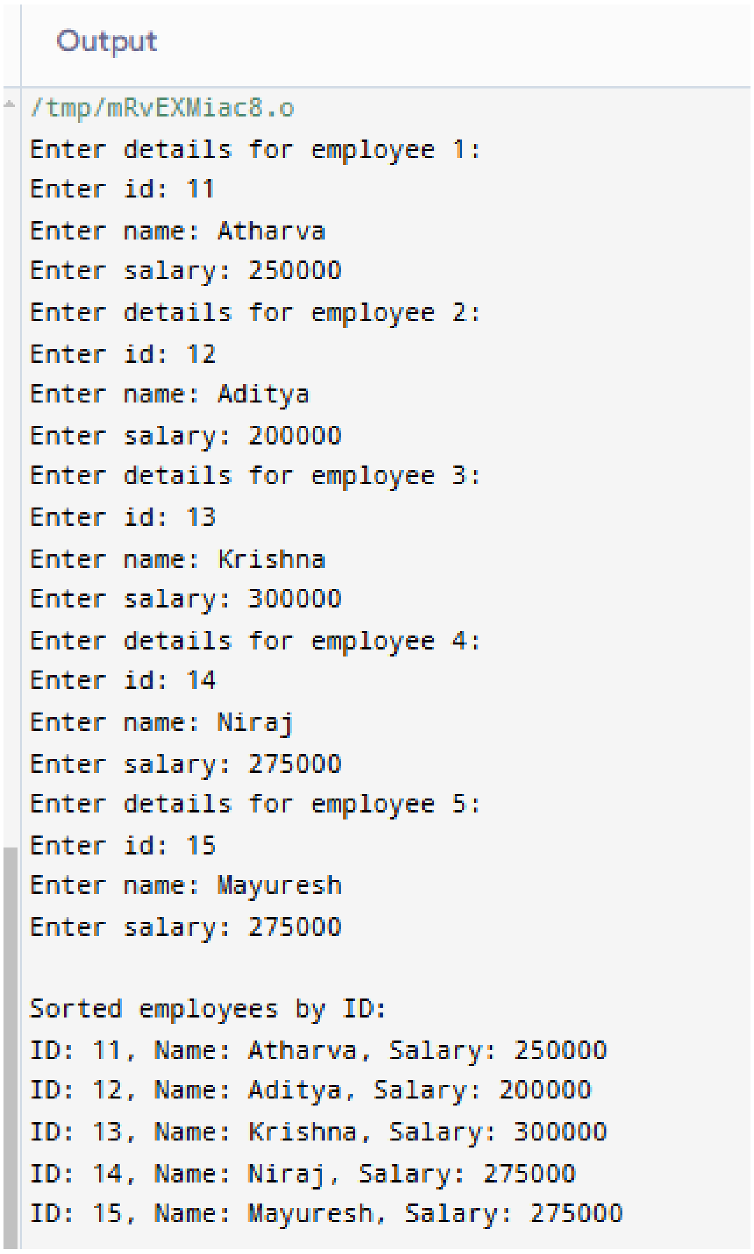
```
};

void quicksort(emp x[],int f,int l)
{
    int pivot,i,j;
    if(f<l)
    {
        pivot=f,j=l,i=f+1;
        while(i<=j)
        {
            while(x[i].id < x[pivot].id)
            {
                i++;
            }
            while(x[j].id > x[pivot].id)
            {
                j--;
            }
            if(i<j)
            {
                emp temp=x[i];
                x[i]=x[j];
                x[j]=temp;
            }
        }
        emp temp=x[pivot];
        x[pivot]=x[j];
        x[j]=temp;
        quicksort(x,f,j-1);
        quicksort(x,j+1,l);
    }
}

int main()
{
    emp employees[5];
    for (int i=0; i<5; ++i)
    {
        std::cout<<"Enter details for employee:"<<(i+1)<<":\n";
        employees[i].read();


    }


    quicksort(employees, 0, 4);
    std::cout << "\nSorted employees by ID:\n";
    for (int i=0; i<5; ++i)
    {
        std::cout<<"ID: "<<employees[i].id<<",Name:
"<<employees[i].name<<",Salary:"<<employees[i].salary<<std::endl;
    }
    return 0;
}
```

b)

```
#include <iostream>
#include <string>

struct Employee
{
    int empId;
    std::string empName;
    float empSalary;
};


void merge(Employee employees[], int left, int mid, int right)
{
    int n1 = mid - left + 1;
    int n2 = right - mid;
    Employee* L = new Employee[n1];
    Employee* R = new Employee[n2];

    for (int i = 0; i < n1; i++)
    {
        L[i] = employees[left + i];
    }

    for (int j = 0; j < n2; j++)
    {
        R[j] = employees[mid + 1 + j];
    }
```

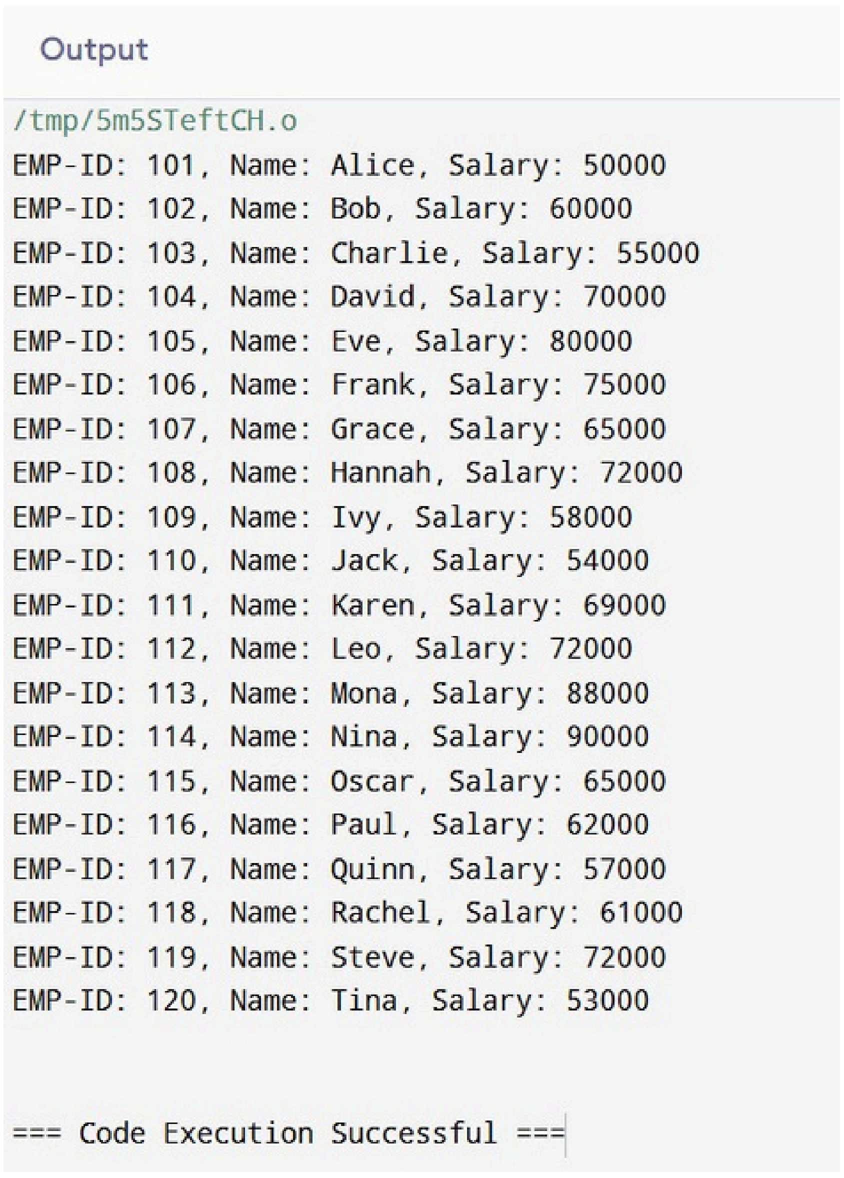
```
int i = 0, j = 0, k = left;
while (i < n1 && j < n2)
{
    if (L[i].empName <= R[j].empName)
    {
        employees[k] = L[i];
        i++;
    }
    else
    {
        employees[k] = R[j];
        j++;
    }
    k++;
}

while (i < n1)
{
    employees[k] = L[i];
    i++;
    k++;
}

while (j < n2)
{
    employees[k] = R[j];
    j++;
    k++;
    }

    delete[]   L;
    delete[] R;
}


void mergeSort(Employee employees[], int left, int right)
{
    if (left < right)
    {
        int mid = left + (right - left) / 2;
        mergeSort(employees, left, mid);
        mergeSort(employees, mid + 1, right);
        merge(employees, left, mid, right);
    }
}

void printEmployees(const Employee employees[], int n)
{
    for (int i = 0; i < n; i++) {
        std::cout << "EMP-ID: " << employees[i].empId
        << ", Name: " << employees[i].empName
        << ", Salary: " << employees[i].empSalary << std::endl;
    }
}

int main()
{
 Employee employees[20] =
    {
        {101, "Alice", 50000}, {102, "Bob", 60000}, {103, "Charlie", 55000},
        {104, "David", 70000}, {105, "Eve", 80000}, {106, "Frank", 75000},
        {107, "Grace", 65000}, {108, "Hannah", 72000}, {109, "Ivy", 58000},
        {110, "Jack", 54000}, {111, "Karen", 69000}, {112, "Leo", 72000},
        {113, "Mona", 88000}, {114, "Nina", 90000}, {115, "Oscar", 65000},
        {116, "Paul", 62000}, {117, "Quinn", 57000}, {118, "Rachel", 61000},
        {119, "Steve", 72000}, {120, "Tina", 53000}


    };


    mergeSort(employees, 0, 19);
    printEmployees(employees, 20);
    return 0;
}
```

Output:

a) 

```
/tmp/mRvEXMiac8.o
Enter details for employee 1:
Enter id: 11
Enter name: Atharva
Enter salary: 250000
Enter details for employee 2:
Enter id: 12
Enter name: Aditya
Enter salary: 200000
Enter details for employee 3:
Enter id: 13
Enter name: Krishna
Enter salary: 300000
Enter details for employee 4:
Enter id: 14
Enter name: Niraj
Enter salary: 275000
Enter details for employee 5:
Enter id: 15
Enter name: Mayuresh
Enter salary: 275000

Sorted employees by ID:
ID: 11, Name: Atharva, Salary: 250000
ID: 12, Name: Aditya, Salary: 200000
ID: 13, Name: Krishna, Salary: 300000
ID: 14, Name: Niraj, Salary: 275000
ID: 15, Name: Mayuresh, Salary: 275000
```

b)



```
/tmp/5m5STeftCH.o
EMP-ID: 101, Name: Alice, Salary: 50000
EMP-ID: 102, Name: Bob, Salary: 60000
EMP-ID: 103, Name: Charlie, Salary: 55000
EMP-ID: 104, Name: David, Salary: 70000
EMP-ID: 105, Name: Eve, Salary: 80000
EMP-ID: 106, Name: Frank, Salary: 75000
EMP-ID: 107, Name: Grace, Salary: 65000
EMP-ID: 108, Name: Hannah, Salary: 72000
EMP-ID: 109, Name: Ivy, Salary: 58000
EMP-ID: 110, Name: Jack, Salary: 54000
EMP-ID: 111, Name: Karen, Salary: 69000
EMP-ID: 112, Name: Leo, Salary: 72000
EMP-ID: 113, Name: Mona, Salary: 88000
EMP-ID: 114, Name: Nina, Salary: 90000
EMP-ID: 115, Name: Oscar, Salary: 65000
EMP-ID: 116, Name: Paul, Salary: 62000
EMP-ID: 117, Name: Quinn, Salary: 57000
EMP-ID: 118, Name: Rachel, Salary: 61000
EMP-ID: 119, Name: Steve, Salary: 72000
EMP-ID: 120, Name: Tina, Salary: 53000


=== Code Execution Successful ===
```