Q: Write a program in C++ to implement a class Employee using following concepts: Pointer to Objects, Dynamic Memory Allocation using new and delete, Dynamic constructors, Destructors

Answer:

Source Code:

```
#include<iostream>
#include<string>
#include<iomanip>
using namespace std;

class Employee{
   private:
      // int holidays;
      long long int id,salary;
      string name;
      int friend find(Employee *arr[], int n, string name,long long int id, bool mode_id, bool print);
      void friend display(Employee *arr[],int , bool );
      void friend sort(Employee *arr[],int n,int form);
      void friend del(Employee *arr[], int n,int pos);
   public:
      Employee(){}
      Employee(int i, string n,long long int s){
         id = i;
         name = n;
         salary = s;
         // holidays = h;
      }
};

int find(Employee *arr[],int n,string name,long long int id,bool mode_id, bool print){
   bool found=false;
   for(int i=0;i<n;i++){
      if((!mode_id && arr[i]->name==name) || (mode_id && arr[i]->id == id)){
         found = true;
         if(print)display(arr,i,found);
```

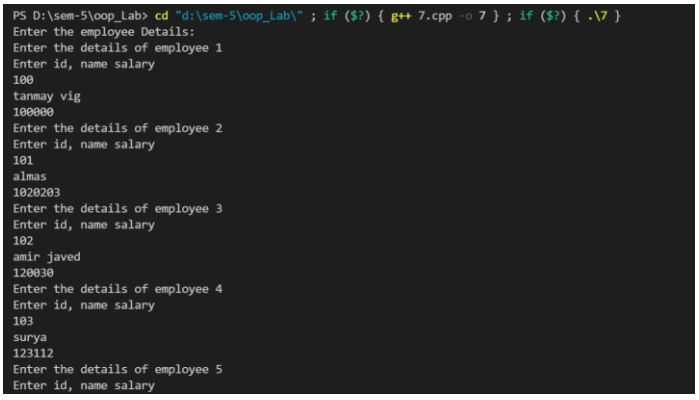
```
            return i;
            break;
        }
    }
    if(!found) cout<<"No related data found.\n";
    return -1;
}

void display(Employee *arr[],int n, bool single){
    cout<<"----------------------------------------\n";
    cout<<"|id       |Name          |Salary    |\n";
    cout<<"----------------------------------------\n";
    if(single){
        cout<<left<<"|"<<setw(10)<<(*arr[n]).id<<"|"<<setw(15)<<(*arr[n]).name<<"|"<<setw(10)<<(*arr[n]).salary<<"|\n";
        cout<<"----------------------------------------\n";
    }else{
        for(int i=0;i<n;i++){
            cout<<left<<"|"<<setw(10)<<(*arr[i]).id<<"|"<<setw(15)<<(*arr[i]).name<<"|"<<setw(10)<<(*arr[i]).salary<<"|\n";
            cout<<"----------------------------------------\n";
        }
    }
}

void sort(Employee *arr[],int n,int form){
    for(int i=0;i<n-1;i++){
        for(int j=0;j<n-i-1;j++){
            if((form == 1 && arr[j]->id>arr[j+1]->id) || (form==2 && arr[j]->name.compare(arr[j+1]->name)>0) || (form==3 && arr[j]->salary>arr[j+1]->salary)){
                Employee temp = *arr[j];
                *arr[j] = *arr[j+1];
                *arr[j+1] = temp;
            }

        }
    }
    display(arr,n,false);
```

```
}


void del(Employee *arr[],int n,int pos){
   for(int i=pos;i<n-1;i++){
      Employee temp = *arr[i];
      *arr[i] = *arr[i+1];
      *arr[i+1] = temp;
   }
   cout<<"Deleted\n";
}


int main(){
   int n=5;
   Employee *arr[100];
   cout<<"Enter the employee Details:\n";
   for(int i=0;i<n;i++){
      long long int id, salary; string name;
      cout<<"Enter the details of employee "<<(i+1)<<endl;
      cout<<"Enter id, name salary\n";
      cin>>id;
      cin.ignore();
      getline(cin,name);
      cin>>salary;
      arr[i] = new Employee(id,name,salary);
   }
   while(true){
      int choice=0,s=0;
      long long int id,salary;
      string name;
      cout<<"to display data of all employees Enter 1\nto display data of one employee Enter 2\nto sort data Enter 3\nto delete Enter 4\nto insert n
ew employee Enter 5\nto exit Enter 0\n";
      cin>>choice;
      switch (choice)
      {
      case 2:
         cout<<"to search by name Enter 1\nto search by id Enter 2\n";
         cin>>s;
```

```
    if(s==1){
        cout<<"Enter name: ";
        cin.clear();
        cin.sync();
        getline(cin,name);
        find(arr,n,name,-1,false,true);
    }else{
        cout<<"Enter id: ";
        cin>>s;
        find(arr,n,"",s,true,true);
    }
    break;
case 1:
    display(arr,n,false);
    break;
case 3:
    cout<<"to sort by id Enter 1\nto sort by name Enter 2\nto sort by salary Enter 3\n";
    cin>>s;
    sort(arr,n,s);
    break;
case 4:
    cout<<"to find by id Enter 1\nto find by name Enter 2\n";
    cin>>s;
    if(s==1){
        cout<<"Enter id: ";cin>>s;
        s=find(arr,n,"",s,true,false);
    }else{
        cin.clear();
        cin.sync();
        getline(cin,name);
        s=find(arr,n,name,-1,false,false);
    }
    if(s!=-1){
        del(arr,n,s);
        n--;
    }
```

```
            break;
        case 5:
            cout<<"Enter id, name, salary\n";
            cin>>id;
            cin.ignore();
            getline(cin,name);
            cin>>salary;
            arr[n++] = new Employee(id,name,salary);
            break;
        default:
            choice =0;
            break;
        }
        if(!choice) break;
    }
    return 0;
}
```

Output:



```
123112
Enter the details of employee 5
Enter id, name salary
104
faisal ahmed
11121
to display data of all employees Enter 1
to display data of one employee Enter 2
to sort data Enter 3
to delete Enter 4
to insert new employee Enter 5
to exit Enter 0
1
---------------------------------------
|id       |Name           |Salary    |
---------------------------------------
|100      |tanmay vig     |100000    |
---------------------------------------
|101      |almas          |1020203   |
---------------------------------------
|102      |amir javed     |120030    |
---------------------------------------
|103      |surya          |123112    |
---------------------------------------
```

```
---------------------------------------
|id       |Name           |Salary    |
---------------------------------------
|100      |tanmay vig     |100000    |
---------------------------------------
|101      |almas          |1020203   |
---------------------------------------
|102      |amir javed     |120030    |
---------------------------------------
|103      |surya          |123112    |
---------------------------------------
|104      |faisal ahmed   |11121     |
---------------------------------------
to display data of all employees Enter 1
to display data of one employee Enter 2
to sort data Enter 3
to delete Enter 4
to insert new employee Enter 5
to exit Enter 0
2
to search by name Enter 1
to search by id Enter 2
1
Enter name: almas
```

```
to display data of all employees Enter 1
to display data of one employee Enter 2
to sort data Enter 3
to delete Enter 4
to insert new employee Enter 5
to exit Enter 0
2
to search by name Enter 1
to search by id Enter 2
1
Enter name: almas
---------------------------------------
|id       |Name           |Salary    |
---------------------------------------
|101      |almas          |1020203   |
---------------------------------------
to display data of all employees Enter 1
to display data of one employee Enter 2
to sort data Enter 3
to delete Enter 4
to insert new employee Enter 5
to exit Enter 0
2
to search by name Enter 1
```

```
to sort data Enter 3
to delete Enter 4
to insert new employee Enter 5
to exit Enter 0
2
to search by name Enter 1
to search by id Enter 2
103
Enter id: 103
---------------------------------------
|id        |Name           |Salary    |
---------------------------------------
|103       |surya          |123112    |
---------------------------------------
to display data of all employees Enter 1
to display data of one employee Enter 2
to sort data Enter 3
to delete Enter 4
to insert new employee Enter 5
to exit Enter 0
3
to sort by id Enter 1
to sort by name Enter 2
to sort by salary Enter 3
```

```
 to display data of one employee Enter 2
 to sort data Enter 3
 to delete Enter 4
 to insert new employee Enter 5
 to exit Enter 0
 3
 to sort by id Enter 1
 to sort by name Enter 2
 to sort by salary Enter 3
 2
 ---------------------------------------
 |id        |Name           |Salary    |
 ---------------------------------------
 |101       |almas          |1020203   |
 ---------------------------------------
 |102       |amir javed     |120030    |
 ---------------------------------------
 |104       |faisal ahmed   |11121     |
 ---------------------------------------
 |103       |surya          |123112    |
 ---------------------------------------
 |100       |tanmay vig     |100000    |
 ---------------------------------------
 to display data of all employees Enter 1
```

```
to display data of all employees Enter 1
to display data of one employee Enter 2
to sort data Enter 3
to delete Enter 4
to insert new employee Enter 5
to exit Enter 0
3
to sort by id Enter 1
to sort by name Enter 2
to sort by salary Enter 3
3
---------------------------------------
|id        |Name           |Salary    |
---------------------------------------
|104       |faisal ahmed   |11121     |
---------------------------------------
|100       |tanmay vig     |100000    |
---------------------------------------
|102       |amir javed     |120030    |
---------------------------------------
|103       |surya          |123112    |
---------------------------------------
|101       |almas          |1020203   |
---------------------------------------
```

```
to display data of all employees Enter 1
to display data of one employee Enter 2
to sort data Enter 3
to delete Enter 4
to insert new employee Enter 5
to exit Enter 0
3
to sort by id Enter 1
to sort by name Enter 2
to sort by salary Enter 3
1
---------------------------------------
|id        |Name           |Salary    |
---------------------------------------
|100       |tanmay vig     |100000    |
---------------------------------------
|101       |almas          |1020203   |
---------------------------------------
|102       |amir javed     |120030    |
---------------------------------------
|103       |surya          |123112    |
---------------------------------------
|104       |faisal ahmed   |11121     |
---------------------------------------
```

```
-------------------------------------
to display data of all employees Enter 1
to display data of one employee Enter 2
to sort data Enter 3
to delete Enter 4
to insert new employee Enter 5
to exit Enter 0
4
to find by id Enter 1
to find by name Enter 2
1
Enter id: 103
Deleted
to display data of all employees Enter 1
to display data of one employee Enter 2
to sort data Enter 3
to delete Enter 4
to insert new employee Enter 5
to exit Enter 0
1
---------------------------------------
|id        |Name           |Salary    |
---------------------------------------
|100       |tanmay vig     |100000    |
```

```
---------------------------------------
|id        |Name           |Salary    |
---------------------------------------
|100       |tanmay vig     |100000    |
---------------------------------------
|101       |almas          |1020203   |
---------------------------------------
|102       |amir javed     |120030    |
---------------------------------------
|104       |faisal ahmed   |11121     |
---------------------------------------
to display data of all employees Enter 1
to display data of one employee Enter 2
to sort data Enter 3
to delete Enter 4
to insert new employee Enter 5
to exit Enter 0
4
to find by id Enter 1
to find by name Enter 2
2
almas
Deleted
to display data of all employees Enter 1
```

```
to display data of all employees Enter 1
to display data of one employee Enter 2
to sort data Enter 3
to delete Enter 4
to insert new employee Enter 5
to exit Enter 0
1
---------------------------------------
|id        |Name           |Salary    |
---------------------------------------
|100       |tanmay vig     |100000    |
---------------------------------------
|102       |amir javed     |120030    |
---------------------------------------
|104       |faisal ahmed   |11121     |
---------------------------------------
to display data of all employees Enter 1
to display data of one employee Enter 2
to sort data Enter 3
to delete Enter 4
to insert new employee Enter 5
to exit Enter 0
5
Enter id, name, salary
```

```
5
Enter id, name, salary
105
almas
10020
to display data of all employees Enter 1
to display data of one employee Enter 2
to sort data Enter 3
to delete Enter 4
to insert new employee Enter 5
to exit Enter 0
1
---------------------------------------
|id        |Name           |Salary    |
---------------------------------------
|100       |tanmay vig     |100000    |
---------------------------------------
|102       |amir javed     |120030    |
---------------------------------------
|104       |faisal ahmed   |11121     |
---------------------------------------
|105       |almas          |10020     |
---------------------------------------
to display data of all employees Enter 1
```

```
to delete Enter 4
to insert new employee Enter 5
to exit Enter 0
1
---------------------------------------
|id        |Name           |Salary    |
---------------------------------------
|100       |tanmay vig     |100000    |
---------------------------------------
|102       |amir javed     |120030    |
---------------------------------------
|104       |faisal ahmed   |11121     |
---------------------------------------
|105       |almas          |10020     |
---------------------------------------
to display data of all employees Enter 1
to display data of one employee Enter 2
to sort data Enter 3
to delete Enter 4
to insert new employee Enter 5
to exit Enter 0
0
```