Institute of Computer Technology

B. Tech. Computer Science and Engineering

Sub: ESFP – II

Course Code: 2CSE203

Practical – 10

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Sem - 2

Branch: CS

Class: B

Batch: 25

Objective:

To learn about object-oriented features, polymorphism (Function & Operator overloading).

Problem Definition-1: Complete the code for the object assigned to you to satisfy following specifications.

Code:

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

const int MAX_EMPLOYEES = 100;

class EmployeeManager;
class EmployeeDatabase;

class Employee
{
    friend class EmployeeManager;
    friend class EmployeeDatabase;

private:
    string name;
```

```
    int id;
    double salary;
    bool isPresent;
    string department;

public:
    Employee() : isPresent(false) {}
    ~Employee()
    {
        cout << "Destroying employee: " << name << endl;
    }

    void markAttendance(bool present)
    {
        isPresent = present;
        if (!isPresent)
        {
            salary -= 50;
        }
    }

    void resetSalary()
    {
        salary = 0;
    }

    void increaseSalary(double amount)
    {
        salary += amount;
    }

    bool operator>(const Employee &emp)
    {
        return name > emp.name;
    }

    bool operator<(const Employee &emp)
    {
        return id < emp.id;
    }

    bool operator==(const Employee &emp)
    {
        return salary == emp.salary;
    }

    friend ostream &operator<<(ostream &out, const Employee &emp)
    {
```

```
        out << "Name: " << emp.name << endl;
        out << "ID: " << emp.id << endl;
        out << "Salary: " << emp.salary << endl;
        out << "Department: " << emp.department << endl;
        return out;
    }

    friend istream &operator>>(istream &in, Employee &emp)
    {
        cout << "Enter employee name: ";
        in >> emp.name;
        cout << "Enter employee ID: ";
        in >> emp.id;
        cout << "Enter employee salary: ";
        in >> emp.salary;
        cout << "Enter employee department: ";
        in >> emp.department;
        return in;
    }

    void setDepartment(const string &dept)
    {
        department = dept;
    }

    string getAttendanceStatus() const
    {
        return isPresent ? "Present" : "Absent";
    }
};

class EmployeeManager
{
private:
    Employee employees[MAX_EMPLOYEES];
    int numEmployees;

public:
    EmployeeManager() : numEmployees(0) {}
    ~EmployeeManager()
    {
        cout << "Destroying EmployeeManager..." << endl;
    }

    int getNumEmployees() const
    {
        return numEmployees;
    }
```

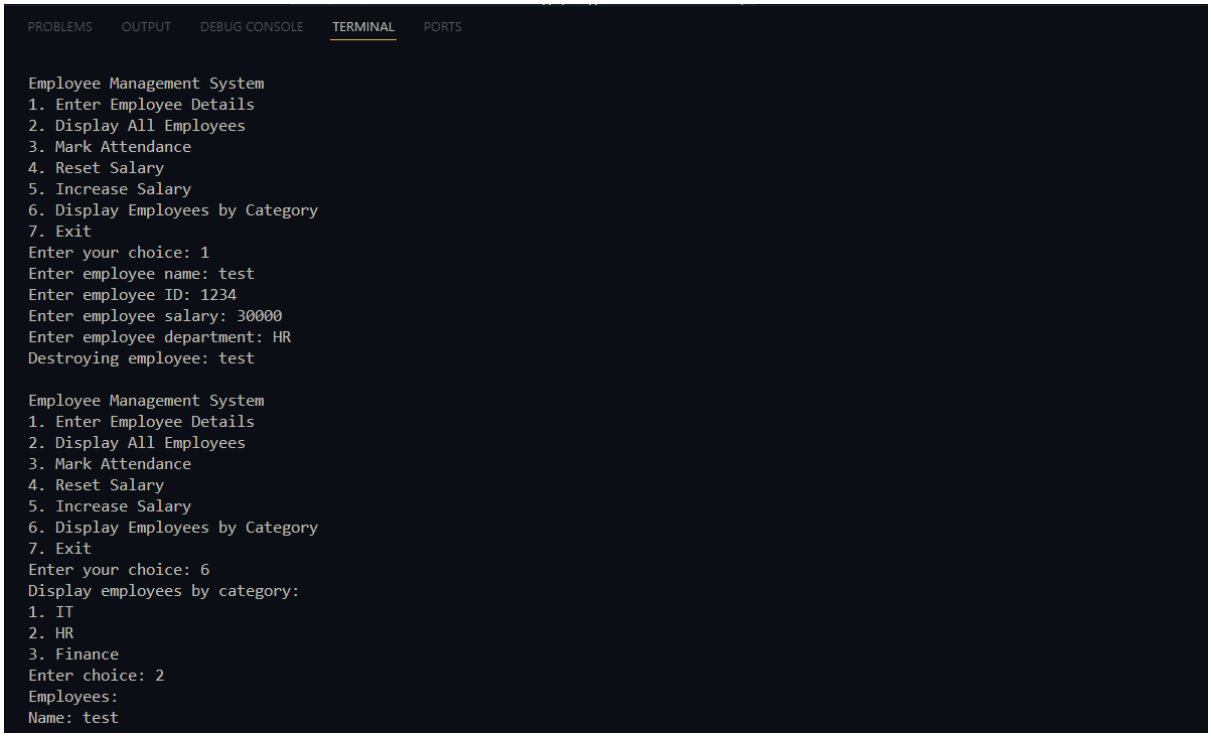
```
    const Employee &getEmployee(int index) const
    {
        return employees[index];
    }

    void addEmployee(const Employee &emp)
    {
        if (numEmployees < MAX_EMPLOYEES)
        {
            employees[numEmployees] = emp;
            numEmployees++;
        }
        else
        {
            cout << "Maximum number of employees reached." << endl;
        }
    }

    void markAttendance(int id, bool present)
    {
        for (int i = 0; i < numEmployees; ++i)
        {
            if (employees[i].id == id)
            {
                employees[i].markAttendance(present);
                cout << "Attendance marked for employee with ID " << id <<
endl;
                return;
            }
        }
        cout << "Employee not found with ID " << id << endl;
    }

    void resetSalary(int id)
    {
        for (int i = 0; i < numEmployees; ++i)
        {
            if (employees[i].id == id)
            {
                employees[i].resetSalary();
                cout << "Salary reset for employee with ID " << id << endl;
                return;
            }
        }
        cout << "Employee not found with ID " << id << endl;
    }
```

```
    void increaseSalary(int id, double amount)
    {
        for (int i = 0; i < numEmployees; ++i)
        {
            if (employees[i].id == id)
            {
                employees[i].increaseSalary(amount);
                cout << "Salary increased for employee with ID " << id <<
endl;
                return;
            }
        }
        cout << "Employee not found with ID " << id << endl;
    }
};

class EmployeeDatabase
{
public:
    void displayByCategory(const EmployeeManager &empManager)
    {
        int choice;
        cout << "Display employees by category:" << endl;
        cout << "1. IT" << endl;
        cout << "2. HR" << endl;
        cout << "3. Finance" << endl;
        cout << "Enter choice: ";
        cin >> choice;

        cout << "Employees:" << endl;
        for (int i = 0; i < empManager.getNumEmployees(); ++i)
        {
            const Employee &employee = empManager.getEmployee(i);
            if (choice == 1 && employee.department == "IT")
            {
                cout << employee << "Attendance: " <<
employee.getAttendanceStatus() << endl;
            }
            else if (choice == 2 && employee.department == "HR")
            {
                cout << employee << "Attendance: " <<
employee.getAttendanceStatus() << endl;
            }
            else if (choice == 3 && employee.department == "Finance")
            {
                cout << employee << "Attendance: " <<
employee.getAttendanceStatus() << endl;
            }
```

```
        }
    }
};

int main()
{
    EmployeeManager empManager;
    EmployeeDatabase empDatabase;

    int choice;

    do
    {
        cout << "\nEmployee Management System\n";
        cout << "1. Enter Employee Details\n";
        cout << "2. Display All Employees\n";
        cout << "3. Mark Attendance\n";
        cout << "4. Reset Salary\n";
        cout << "5. Increase Salary\n";
        cout << "6. Display Employees by Category\n";
        cout << "7. Exit\n";
        cout << "Enter your choice: ";
        cin >> choice;

        switch (choice)
        {
        case 1:
        {
            Employee emp;
            cin >> emp;
            empManager.addEmployee(emp);
            break;
        }
        case 2:
        {
            cout << "\nEmployee Details:" << endl;
            for (int i = 0; i < empManager.getNumEmployees(); ++i)
            {
                cout << empManager.getEmployee(i) << "Attendance: " <<
empManager.getEmployee(i).getAttendanceStatus() << endl;
            }
            break;
        }
        case 3:
        {
            int employeeId;
            bool present;
            cout << "\nEnter employee ID to mark attendance: ";
```

```
            cin >> employeeId;
            cout << "Enter 1 for present, 0 for absent: ";
            cin >> present;
            empManager.markAttendance(employeeId, present);
            break;
        }
        case 4:
        {
            int employeeId;
            cout << "\nEnter employee ID to reset salary: ";
            cin >> employeeId;
            empManager.resetSalary(employeeId);
            break;
        }
        case 5:
        {
            int employeeId;
            double amount;
            cout << "\nEnter employee ID to increase salary: ";
            cin >> employeeId;
            cout << "Enter amount to increase: ";
            cin >> amount;
            empManager.increaseSalary(employeeId, amount);
            break;
        }
        case 6:
        {
            empDatabase.displayByCategory(empManager);
            break;
        }
        case 7:
        {
            cout << "Exiting program..." << endl;
            break;
        }
        default:
            cout << "Invalid choice. Please try again." << endl;
        }

    } while (choice != 7);

    return 0;
}
```

Output –


PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
Employee Management System
1. Enter Employee Details
2. Display All Employees
3. Mark Attendance
4. Reset Salary
5. Increase Salary
6. Display Employees by Category
7. Exit
Enter your choice: 1
Enter employee name: test
Enter employee ID: 1234
Enter employee salary: 30000
Enter employee department: HR
Destroying employee: test
Employee Management System
1. Enter Employee Details
2. Display All Employees
3. Mark Attendance
4. Reset Salary
5. Increase Salary
6. Display Employees by Category
7. Exit
Enter your choice: 6
Display employees by category:
1. IT
2. HR
3. Finance
Enter choice: 2
Employees:
Name: test