OOP Lab 7 – part 3
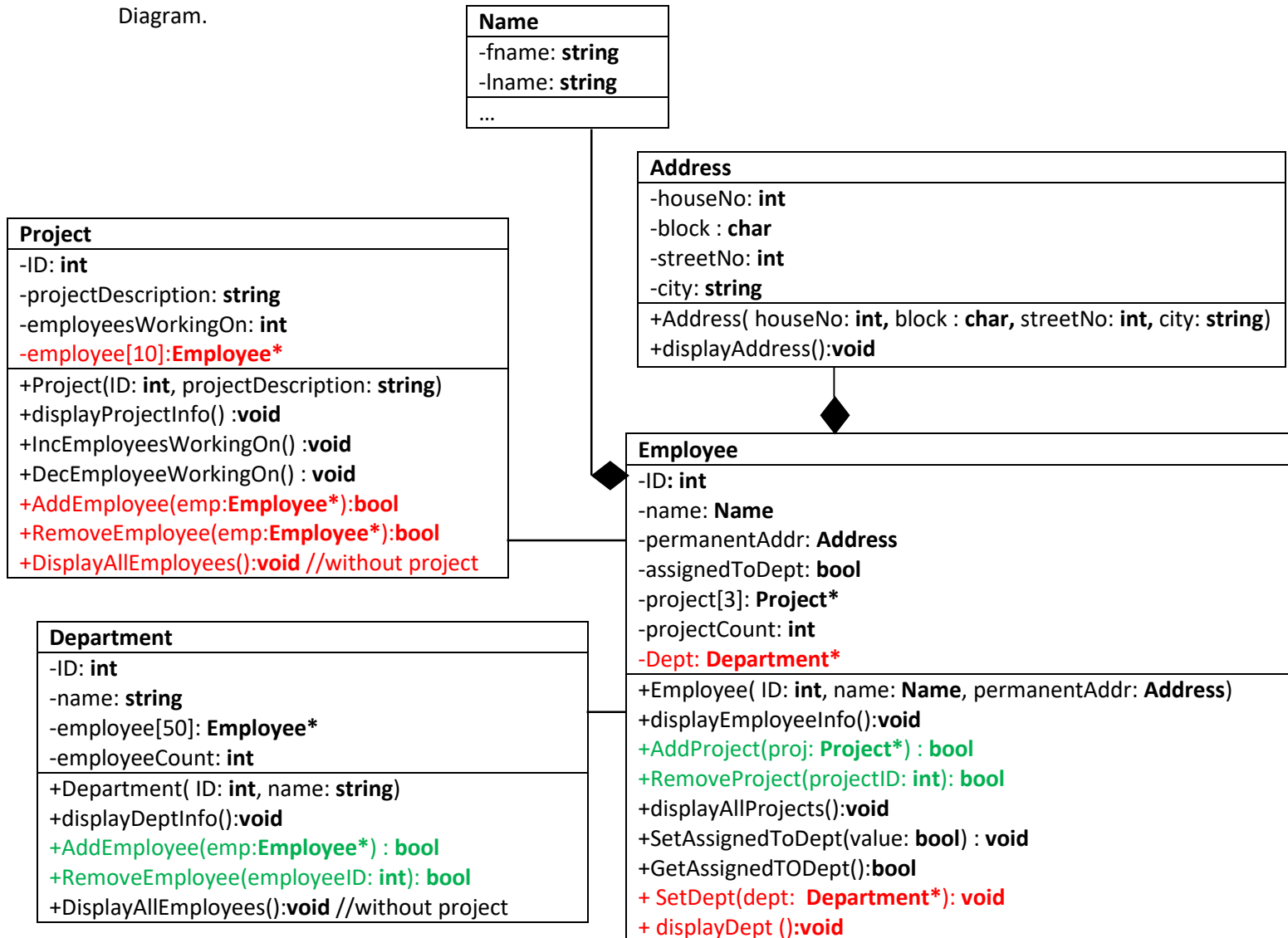
Topic: Operator Overloading

Marks: (TBA)

Release Date: 27-Nov-20 Friday

Submission Date & Time: 1-Dec-20, 11:59 PM Tuesday

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Implement the classes (perform multi-filing) and their relationships as mentioned by following UML Diagram.

Name
- -fname: **string**
- -lname: **string**
- ...

Address
- -houseNo: **int**
- -block : **char**
- -streetNo: **int**
- -city: **string**
- +Address(houseNo: **int,** block : **char,** streetNo: **int,** city: **string**)
- +displayAddress():**void**

Project
- -ID: **int**
- -projectDescription: **string**
- -employeesWorkingOn: **int**
- -employee[10]:**Employee***
- +Project(ID: **int**, projectDescription: **string**)
- +displayProjectInfo() :**void**
- +IncEmployeesWorkingOn() :**void**
- +DecEmployeeWorkingOn() : **void**
- +AddEmployee(emp:**Employee***):**bool**
- +RemoveEmployee(emp:**Employee***):**bool**
- +DisplayAllEmployees():**void** //without project

Employee
- -ID**: int**
- -name: **Name**
- -permanentAddr: **Address**
- -assignedToDept: **bool**
- -project[3]: **Project***
- -projectCount: **int**
- -Dept: **Department***
- +Employee(ID: **int**, name: **Name**, permanentAddr: **Address**)
- +displayEmployeeInfo():**void**
- +AddProject(proj: **Project***) : **bool**
- +RemoveProject(projectID: **int**): **bool**
- +displayAllProjects():**void**
- +SetAssignedToDept(value: **bool**) : **void**
- +GetAssignedTODept():**bool**
- + SetDept(dept: **Department***): **void**
- + displayDept ():**void**

Department
- -ID: **int**
- -name: **string**
- -employee[50]: **Employee***
- -employeeCount: **int**
- +Department(ID: **int**, name: **string**)
- +displayDeptInfo():**void**
- +AddEmployee(emp:**Employee***) : **bool**
- +RemoveEmployee(employeeID: **int**): **bool**
- +DisplayAllEmployees():**void** //without project

- Now you have to create **Association** between Project and Employee. A project must know what employees are working on it and no more than 10 employees can work on a Project. Add data members **Employee* employee[10]** in **Project** class. Also "Forward Declare" Employee class in the Project class. Three new member functions are added **bool AddEmployee(Employee* emp), bool RemoveEmployee(Employee* emp)** and **void DisplayAllEmployees()**.

  Also update member function of class Employee, **bool** Employee::AddProject(**Project*** proj) to call **bool** Project::AddEmployee(**Employee*** emp) function of Project.

  Likewise, update member function of class Employee, **bool** Employee::RemoveProject(**int** projectID) to call **bool** Project::RemoveEmployee(**Employee*** emp) function of Project.

- Develop **Association** between Employee and Department. An employee must know, which department he belongs to. "Forward Declare" Department in Employee and maintain a pointer **Department*** dept, in the Employee class. Add two new member functions **bool** Employee::setDept(Department* d) and void Employee::displayDept() in Employee class.

  Also update Department's member function **bool** Department::AddEmployee(**Employee* emp**) to call **bool** Employee:: setDept(Department* d).

  Likewise, update member function of class Employee, **bool** Employee::RemoveEmployee(int employeeID) to call **bool** Employee:: setDept(Department* d), with NULL passed as parameter to it.

In main make Menu Options according to the numbers below:
1-Create Department
2-Create Employee
3-Create Project
4-Display A Department given its ID, (if it exists)
5-Display An Employee given its ID, (if it exists)
6-Display A Project given its ID, (if it exists)
7-Add an Employee to a Department, provided the IDs
8-Add a Project to an Employee, provided the IDs
9-Display all projects of An Employee given his/her ID
10-Display all employees of a Department given its ID
11-Remove an Employee from a Department, provided the IDs
12-Remove a Project from an Employee, provided the IDs
13-Display all Employees working on a project, provided Project ID
14-Display the Department of an Employee, provided Employee ID