Lab 11 - A, (OOC I, 2023): Inheritance v/s Composition and Unit Tests

A hospital needs a software system to manage its employees' information. The system should allow users to create, edit, and delete employee records, as well as list all employees and search for employees by name, joining_year, department (Neurology, Orthopedic, Pedriatric, Cardiology, ER etc) or position. The system has three different types of employees-

- Doctor
- Nurse
- Stuff_of_managment

Each employee has a *name, address, phone number, email,* and *hire_date,*. Each employee also has the following methods:

- *Showdetails():* returns the employee's age in years
- *CalculateYearsOfService():* returns the number of years the employee has worked for the hospital

Nurses have additional information about *position (charge nurse, assisting nurse, head nurse)* and *department.* Docters have the extra information about department, position(head_of _department, senior_doctor, junior_doctor, intern), list of degrees, plus a *list of doctors* they work with. And finally stuff_of_mangement have the extra attributes like department (finance, revenue, quality assurance) ,position (director, accountant, treasurer etc). Define a Hospital class that has a *list of employees* and the following methods:

- *AddEmployee(Employee employee):* adds an employee to the list
- *RemoveEmployee(Employee employee):* removes an employee from the list
- *ListEmployees():* lists all employees in the company
- *SearchByName(string name):* returns a list of employees whose name contains the specified string
- *SearchByJoining_year(int year):* returns a list of employees who joined in that year
- *SearchByPosition(string Position):* returns a list of employees whoseposition contains the specified string
- *SearchByDepartment(string department):* returns a list of employees whose department contains the specified string

Your task is to design and implement the system in C# using OOP concept. You should use **composition and inheritance** to represent the necessary relationships. Finally, write unit tests for the following methods:

- `CalculateYearsOfService()` method of the Employee class
- *SearchByJoining_year(int year)* method of the Company class
- `SearchByDepartment(string department)` method of the Company class