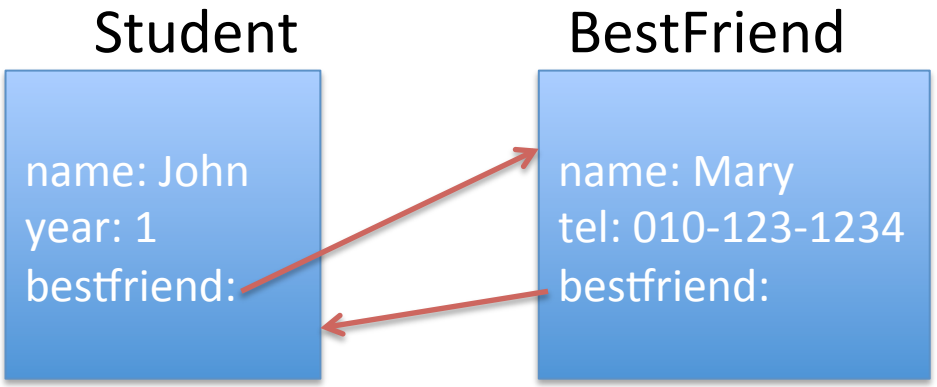
Class2Class Connection

One-to-One

- A class may need to know other class objects
- Forward reference

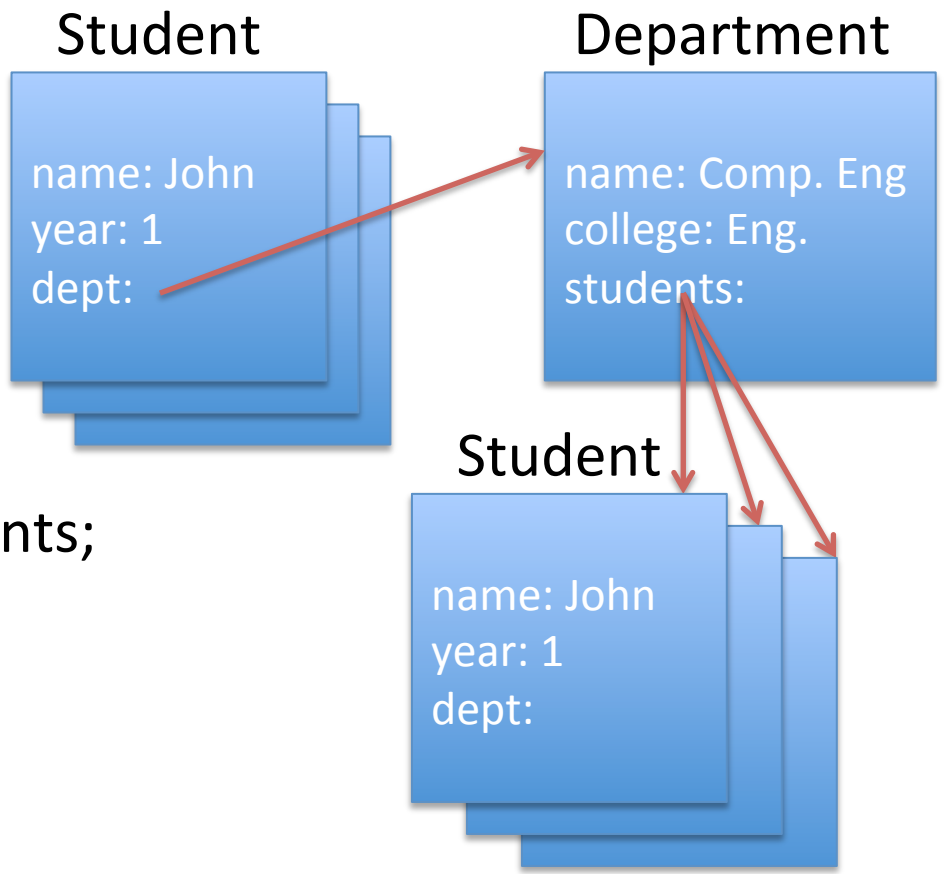
```
class Friend;
class Student {
    Friend &bestfriend;
}
class Friend {
    Student &bestfriend;
}
```



One-to-Many

- vector of copies (wrong)

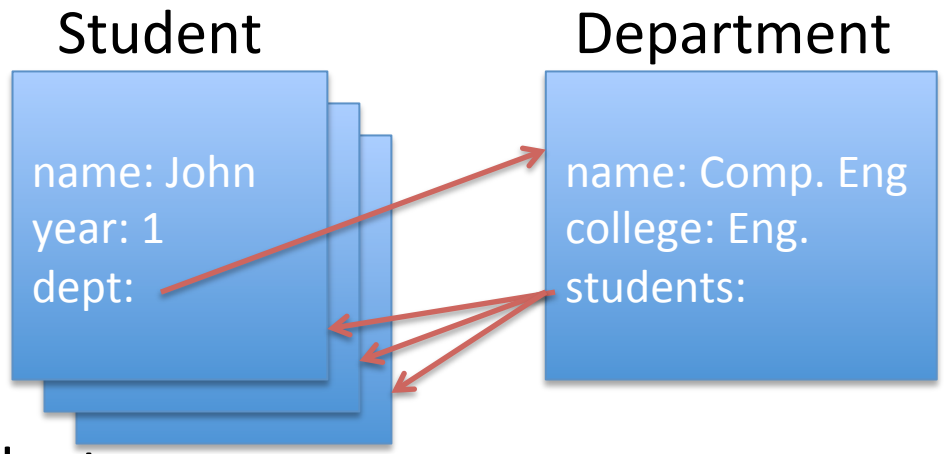
```
class Department;
class Student {
    Dept &dept;
}
class Dept {
    vector<Student> students;
}
```



One-to-Many

- Pointer vector

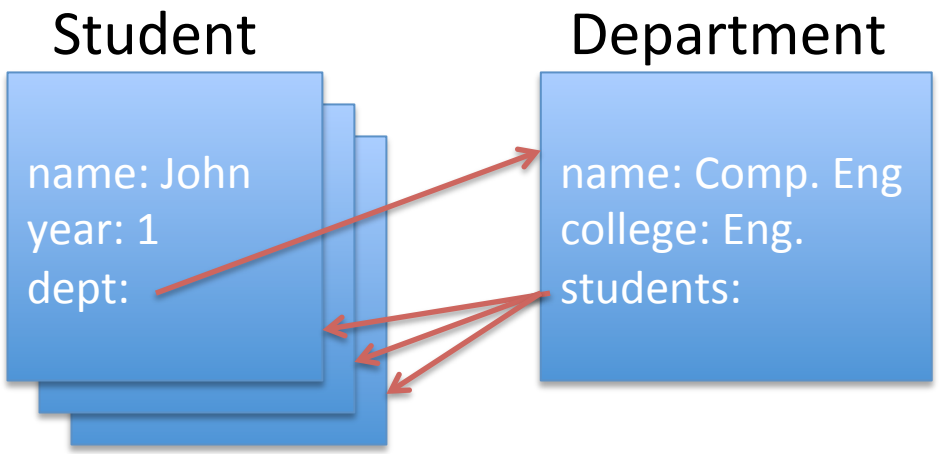
```
class Department;
class Student {
    Dept &dept;
}
class Dept {
    vector<Student *> students;
    string std_name(int i) { return students[i]->get_name(); }
}
```



One-to-Many

- Reference vector (wrong)

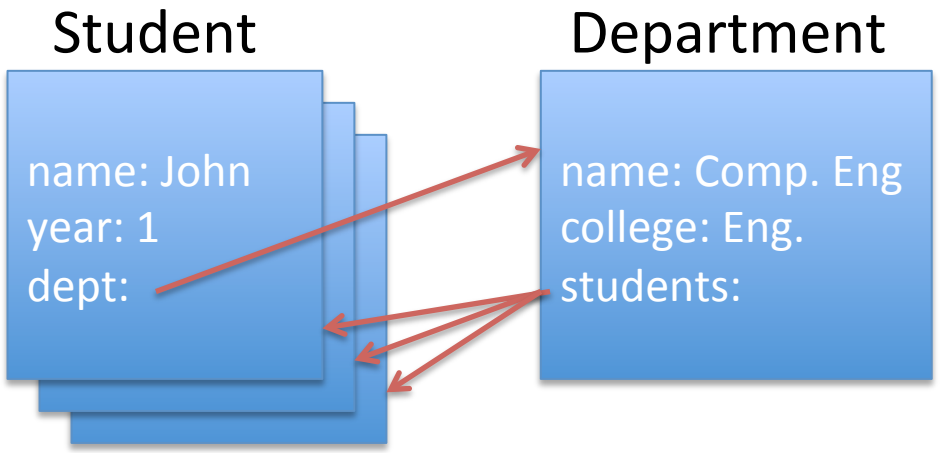
```
class Department;
class Student {
    Dept &dept;
}
class Dept {
    vector<Student &> students; ← ERROR
}
```



One-to-Many

- Reference wrapper vector (C++11)

```
class Department;
class Student {
    Dept &dept;
}
class Dept {
    vector<std::reference_wrapper<Student>> students;
    string std_name(int i) { return students[i].get_name(); }
}
```



실습

- reference_wrapper vector를 써서 Dept의 students 를 수정, 해당 코드 수정
- Dept::set_name() 정의
- Test

```
Dept ce( "Computer Engineering" );
Student s1( "Kim", "Soochul", ce );
ce.set_name("Computer Eng.");
check( "dept name", s1.get_dept().get_name(),
        "Computer Engineering" );
check( "std name", ce.get_student_at(0).get_name(),
        "Kim Soochul" );
s1.promote(); // year become 2
check( "s1's year from dept", ce.get_student_at(0).get_year(), 2 );
```

Many-to-Many

```
class Department;
class Student {
      vector<…> subjects;
}
class Subject {
      vector<…> students;
}
```