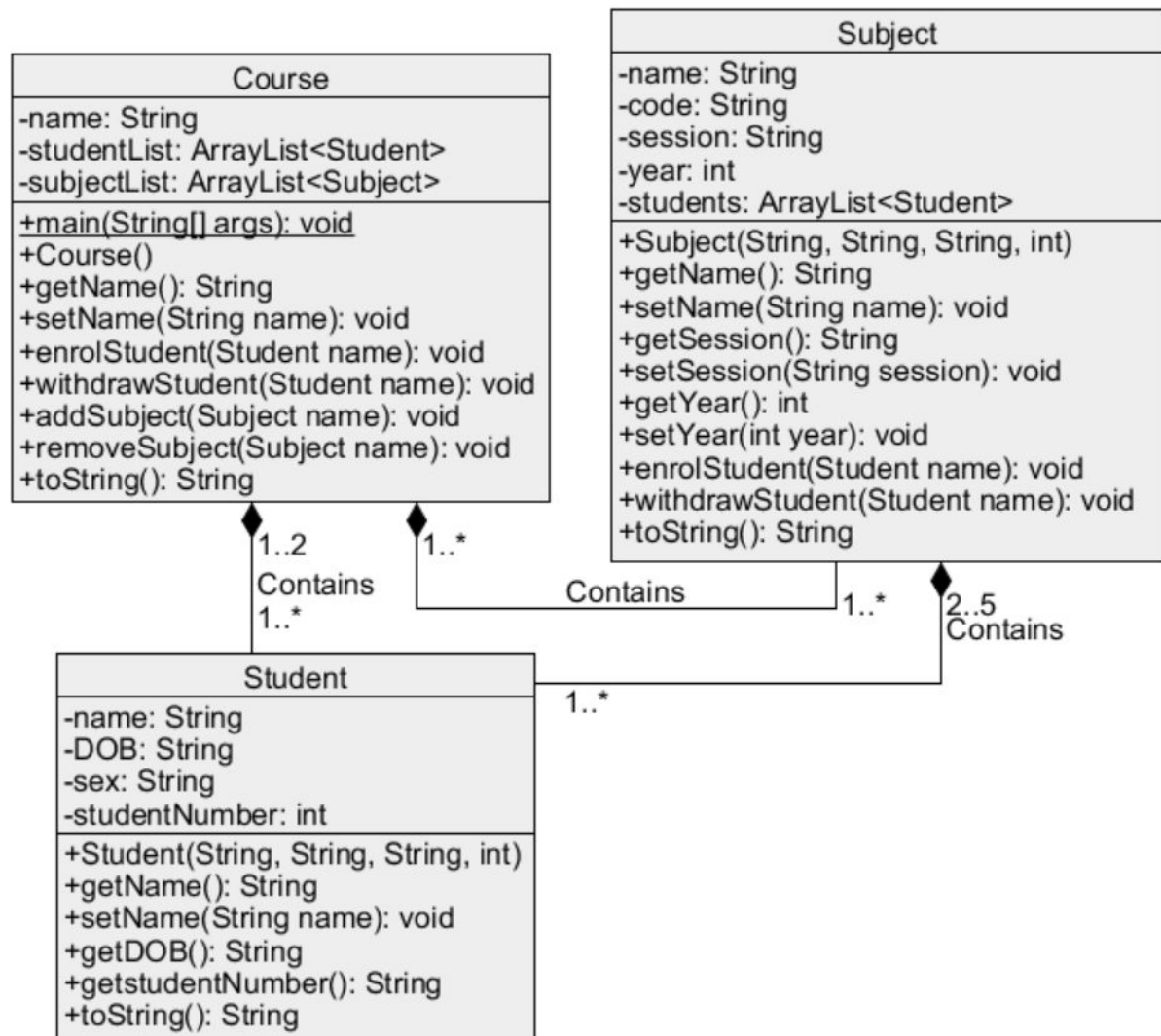


Laboratory 1: Sean Overton

Task 1: UML Design



Task 2: Source Code:

```
import java.util.ArrayList;
```

```
class Course{
    private String name;
    private ArrayList<Student> studentList;
    private ArrayList<Subject> subjectList;

    public static void main(String[] args){
        //Create Course object
        Course compSci = new Course("Bachelor of Computer Science");

        //Create Subjects objects(2 subjects):
        Subject prog1 = new Subject("Programming Fundamentals", "CSIT111", "Spring",
2020);
        Subject prog2 = new Subject("Object Oriented Design and Programming", "CSIT121",
"Spring", 2020);
```

```

//Create Students objects (4 students):
Student Amy = new Student("Amy Bell", "01/01/2001", "Female", 100001);
Student Bob = new Student("Bob Brown", "02/02/2002", "Male", 200001);
Student Cindy = new Student("Cindy Ma", "03/03/2001", "Female", 100003);
Student David = new Student("David Hintz", "04/04/2000", "Male", 100004);

//add subjects and students to course
compSci.addSubject(prog1);
compSci.addSubject(prog2);
compSci.enrolStudent(Amy);
compSci.enrolStudent(Bob);
compSci.enrolStudent(Cindy);
compSci.enrolStudent(David);

//add 3 students to 1 subject and 1 to the other
prog1.enrolStudent(Amy);
prog1.enrolStudent(Bob);
prog1.enrolStudent(Cindy);
prog2.enrolStudent(David);

//testing outputs
compSci.printData();

//remove Cindy from prog1 and enrol in prog2
prog1.withdrawStudent(Cindy);
prog2.enrolStudent(Cindy);

//testing outputs
compSci.printData();
}

//constructor with parameters
public Course(String name){
    this.name = name;
    this.subjectList = new ArrayList<Subject>();
    this.studentList = new ArrayList<Student>();
}

public String getName(){
    return name;
}

public void setName(String name){
    this.name = name;
}

```

```

public void enrolStudent(Student name){
    studentList.add(name);
}

public void withdrawStudent(Student name){
    studentList.remove(name);
}

public void addSubject(Subject name){
    subjectList.add(name);
}

public void removeSubject(Subject name){
    subjectList.remove(name);
}

//allows current course information to be printed
public void printData(){
    System.out.println("-----");
    System.out.printf("Course name: %s\n", name);
    System.out.println();
    for(int i = 0; i < subjectList.size(); i++){
        System.out.printf("Subject Name: %s \n", subjectList.get(i));
    }
    System.out.println("-----");
}
}

class Subject{
    //data-fields
    private String name;
    private String code;
    private String session;
    private int year;
    private ArrayList<Student> students;

    //constructor with parameters
    public Subject(String name, String code, String session, int year){
        this.name = name;
        this.code = code;
        this.session = session;
        this.year = year;
        this.students = new ArrayList<Student>();
    }
}

```

```

public String getName(){
    return name;
}

public void setName(String name){
    this.name = name;
}

public String getSession(){
    return session;
}

public void setSession(String session){
    this.session = session;
}

public int getYear(){
    return year;
}

public void setYear(int year){
    this.year = year;
}

public void enrolStudent(Student name){
    //adds student to data-field arraylist
    students.add(name);
}

public void withdrawStudent(Student name){
    //removes student from data-field arraylist
    students.remove(name);
}

public String toString(){
    String printOut = name + " (" + code + ", " + session + " " + Integer.toString(year) +
    ")\\nEnrolled Students:\\n";
    for(int i = 0; i < students.size(); i++){
        printOut += students.get(i) + "\\n";
    }
    printOut += "\\n";
    return printOut;
}
}

class Student{

```

```
//data-fields
private String name;
private String DOB;
private String sex;
private int studentNumber;

//constructor
public Student(String name, String DOB, String sex, int studentNumber){
    this.name = name;
    this.DOB = DOB;
    this.sex = sex;
    this.studentNumber = studentNumber;
}

public String getName(){
    return name;
}

public void setName(String name){
    this.name = name;
}

public String getDOB(){
    return DOB;
}

public String getstudentNumber(){
    return Integer.toString(studentNumber);
}

public String toString(){
    return name + "\t" + Integer.toString(studentNumber) + "\n";
}
}
```

Task 3: Compilation and Testing

```
C:\Users\Sean\Desktop\Other stuff\UNI\CSI121 OOP\Labs\Lab1>javac Course.java

C:\Users\Sean\Desktop\Other stuff\UNI\CSI121 OOP\Labs\Lab1>java Course
-----
Course name: Bachelor of Computer Science

Subject Name: Programming Fundamentals (CSIT111, Spring 2020)
Enrolled Students:
Amy Bell      (100001)
Bob Brown     (200001)
Cindy Ma      (100003)

Subject Name: Object Oriented Design and Programming (CSIT121, Spring 2020)
Enrolled Students:
David Hintz   (100004)

-----
-----
Course name: Bachelor of Computer Science

Subject Name: Programming Fundamentals (CSIT111, Spring 2020)
Enrolled Students:
Amy Bell      (100001)
Bob Brown     (200001)

Subject Name: Object Oriented Design and Programming (CSIT121, Spring 2020)
Enrolled Students:
David Hintz   (100004)
Cindy Ma      (100003)
```

Therefore, successfully compiled and tested.