Object-Oriented Programming
Lab Session #3

I. References
- Oracle Java Documentation: https://docs.oracle.com/javase/tutorial/java/IandI/index.html
- Inheritance in Java Tutorial: https://www.tutorialspoint.com/java/java_inheritance.htm

II. Exercises
You are required to implement the following design as well as a main() method in another class to test your implementation:

1. Shapes (25 points)
   Implement the hierarchy below where
   - MyShape is a class with a Draw method that does nothing,
   - MyBoundedShape is a class with a GetArea method that does nothing,
   - MyLine, MyOval, MyRectangle are classes

   In the main() method,
   - Ask the user to select 5 shapes and input their dimension
   - Draw selected shapes
   - Compute and show the area of selected shapes if they are abounded shape
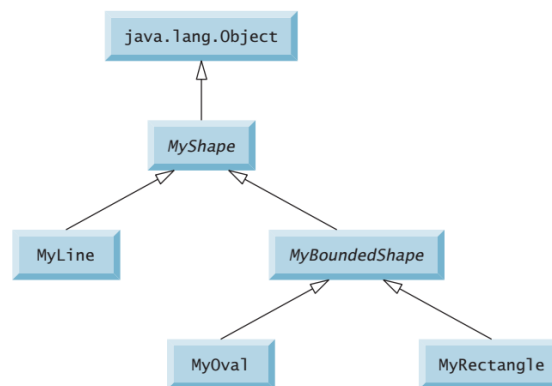
2. Triangle and Point (25 points)

3. Person, Student & Staff (25 points)
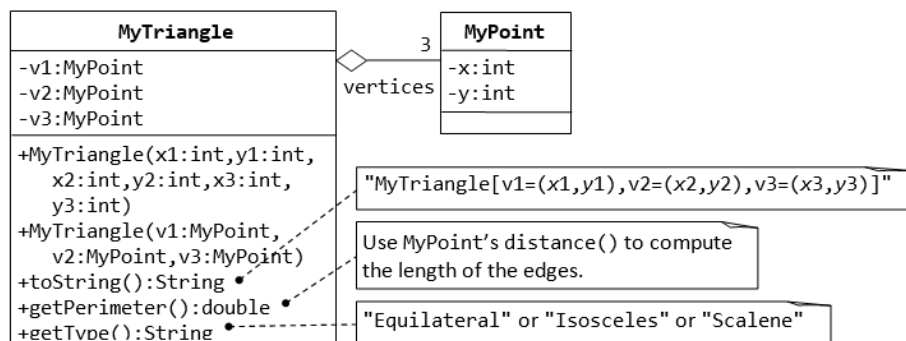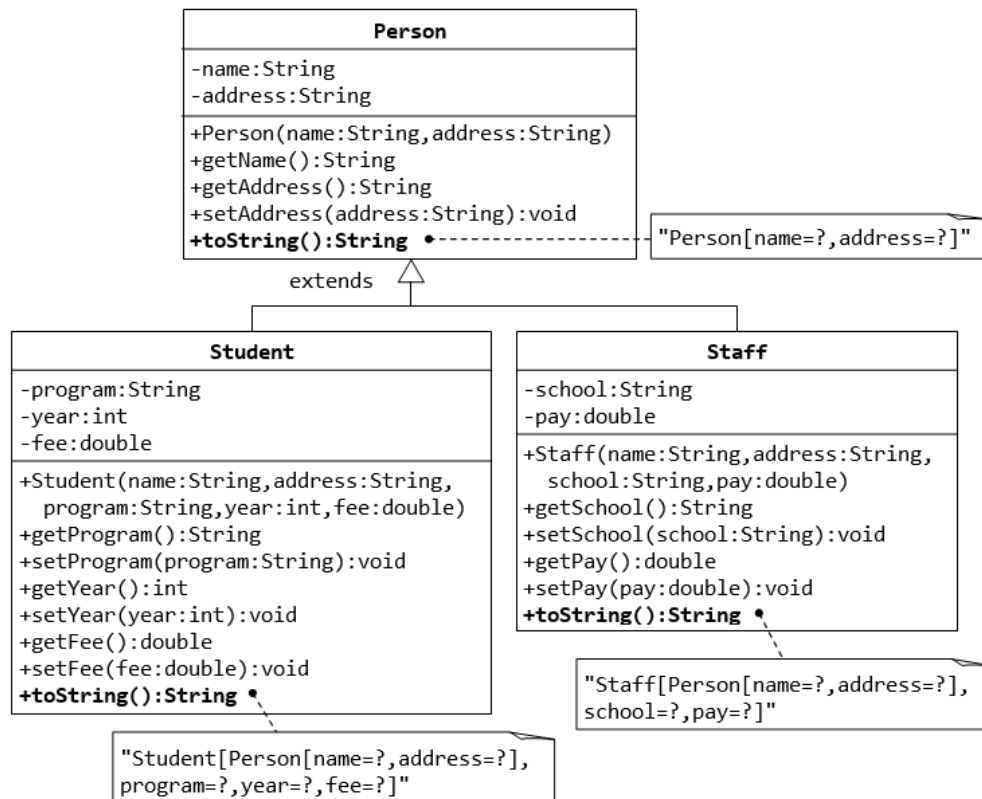
```
                    ┌──────────────────────────────────┐
                    │              Person               │
                    ├──────────────────────────────────┤
                    │ -name:String                      │
                    │ -address:String                   │
                    ├──────────────────────────────────┤
                    │ +Person(name:String,address:String)│
                    │ +getName():String                 │
                    │ +getAddress():String              │
                    │ +setAddress(address:String):void  │
                    │ +toString():String ●─ ─ ─ ─ ─ ─ ─ ─│─ ─ ─ ─ ─ ─ ─ ─ ─┤"Person[name=?,address=?]"│
                    └──────────────────────────────────┘
                              extends △
```

Student
- -program:String
- -year:int
- -fee:double

- +Student(name:String,address:String, program:String,year:int,fee:double)
- +getProgram():String
- +setProgram(program:String):void
- +getYear():int
- +setYear(year:int):void
- +getFee():double
- +setFee(fee:double):void
- **+toString():String ●**

"Student[Person[name=?,address=?], program=?,year=?,fee=?]"

Staff
- -school:String
- -pay:double

- +Staff(name:String,address:String, school:String,pay:double)
- +getSchool():String
- +setSchool(school:String):void
- +getPay():double
- +setPay(pay:double):void
- **+toString():String ●**

"Staff[Person[name=?,address=?], school=?,pay=?]"

4. Point2D and Point3D (25 points)

Point2D
- -x:float = 0.0f
- -y:float = 0.0f

- +Point2D(x:float,y:float)
- +Point2D()
- +getX():float
- +setX(x:float):void
- +getY():float
- +setY(y:float):void
- +setXY(x:float,y:float):void
- +getXY():float[2] ● ─ ─ ─ ─ ─ ─ ─ ─ ┤Array of {x,y}│
- +toString():String ● ─ ─ ─ ─ ─ ─ ─ ─ ┤"(x,y)"│

extends △

Point3D
- -z:float = 0.0f

- +Point3D(x:float,y:float,z:float)
- +Point3D()
- +getZ():float
- +setZ(z:flaot):void
- +setXYZ(x:float,y:flaot,z:float):void ─ ─ ┤Array of {x,y,z}│
- +getXYZ():float[3] ● ─ ─ ─ ─ ─ ─
- +toString():String ● ─ ─ ─ ─ ─ ─ ─ ─ ─ ┤"(x,y,z)"│