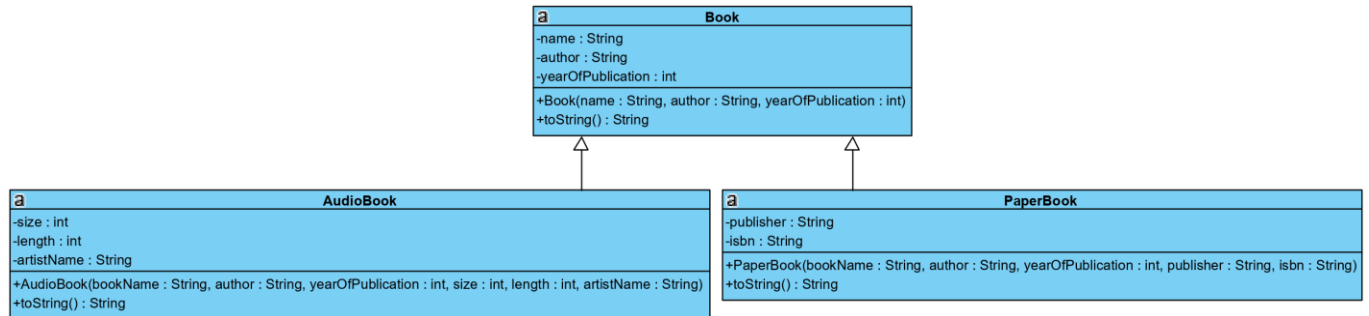# CMPS 251 Tutorial 5 – Fall 2019

Inheritance & Polymorphism

Exercise 1 – Book Class Hierarchy

Create a package named `tutorial5.excercise1` to place all the classes of this exercise.

Implement the following class hierarchy:

- The toString() of Book should return Name - Author - Year Of Publication.
- The toString() of PaperBook should return Name - Author - Year Of Publication - Publisher - ISBN.
- The toString() of AudioBook should return Name - Author - Year Of Publication - Size - Length - Artist name.

The data returned by the toString should be labeled (e.g., Name: Ali Baba and the Forty Thieves – Author: Hanna Diyab).
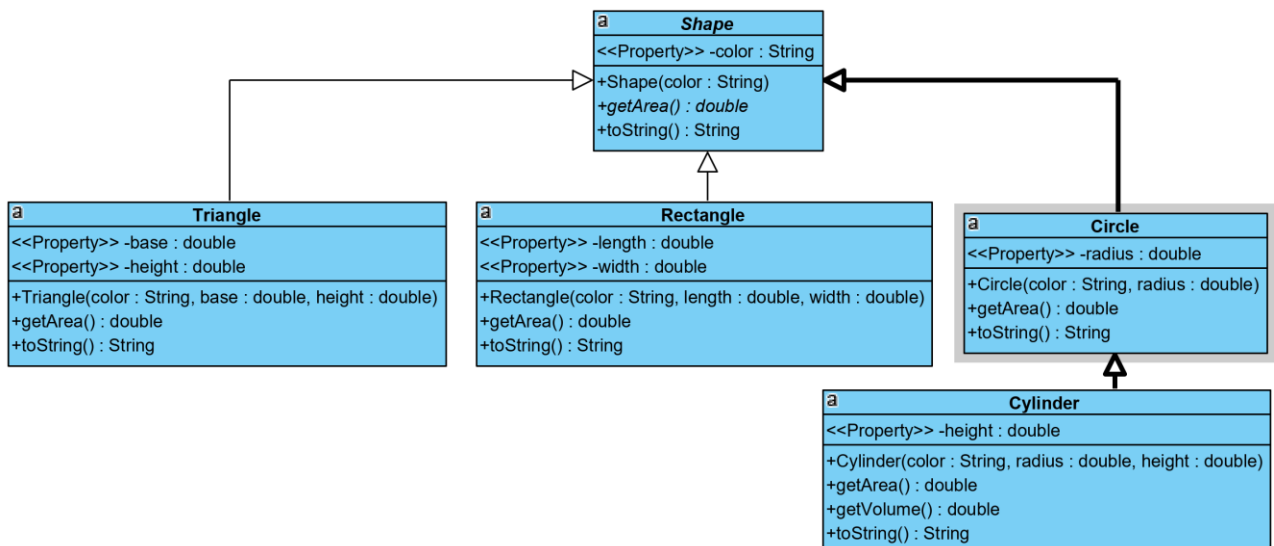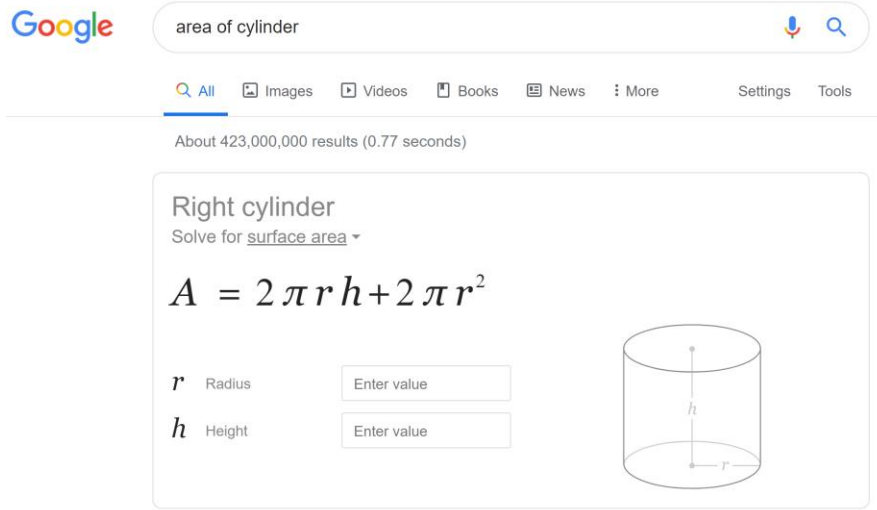
Test your implementation using the main method @
https://gist.github.com/erradi/f59d63f7caadbeab7adbb357ea60cf0d

Exercise 2 – Book Class Hierarchy

Create a package named `tutorial5.excercise2` to place all the classes of this exercise.

Implement the following class hierarchy:

- Lookup the area of each shape on Google then implement the getArea() method in each class. E.g.:

Right cylinder
Solve for surface area ▾

$$A = 2\pi r h + 2\pi r^2$$

r Radius   Enter value

h Height   Enter value

- Implement the toString of each class to produce the output shown below.
- Test your implementation using the main method @
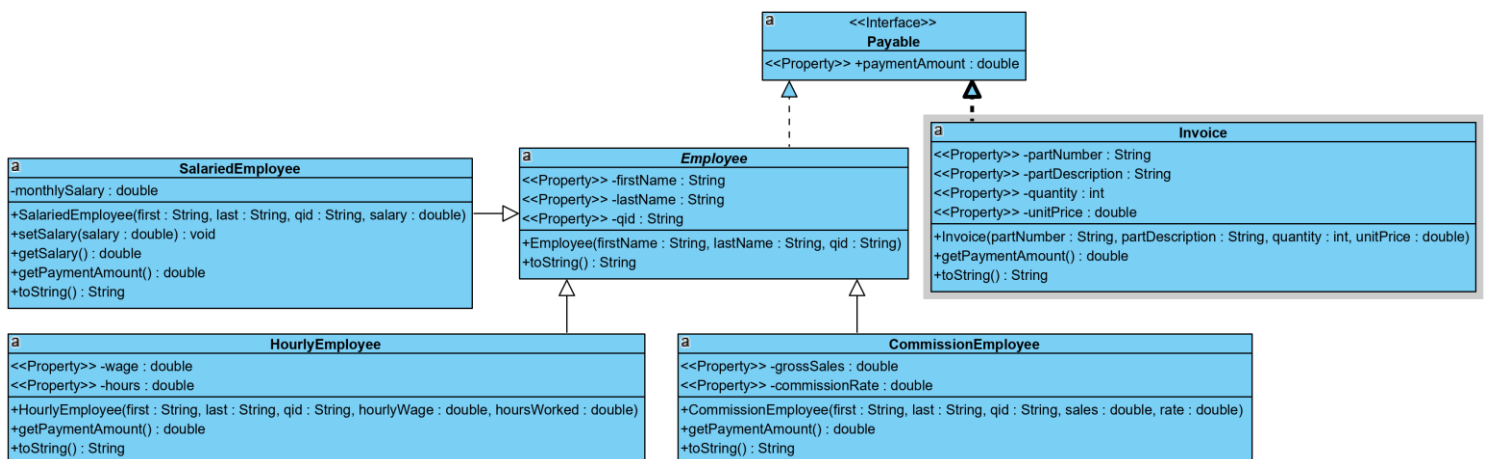 https://gist.github.com/erradi/389426d19413d648a71cf574c8bbd26f

```
White  Circle    - Area:  28.27 - Radius: 3.00
Red    Cylinder  - Area: 282.74 - Radius: 5.00 - Height: 4.00 - Volume: 1130.97
Blue   Cylinder  - Area: 226.19 - Radius: 3.00 - Height: 9.00 - Volume: 2035.75
Yellow Rectangle - Area:  43.50 - Length: 7.50 - Width: 5.80
Brown  Triangle  - Area: 100.00 - Base: 10.00 - Height: 20.00
```

Exercise 3 – Employee Class Hierarchy

Create a package named `tutorial5.excercise3` to place all the classes of this exercise.

Implement the following class hierarchy:

- Note that the amount to pay for HourlyEmployee is *wage * hours*. For CommissionEmployee, it is *grossSales * commissionRate*. For Invoice, it is *quantity * unitPrice*.
- Test your implementation using the main method @
  https://gist.github.com/erradi/f20ad7000635db37b3f5ee0f5c986cd2