package BalloonTester;

/**
 * BalloonProxy.java
 * *
 * @author <a href="mailto: alphonce">Carl G. Alphonce</a>
 * @version
 * /

public class BalloonProxy {
    private Balloon _target;

    public BalloonProxy () {
    }

    public void setTarget(Balloon aBalloon) {
        _target = aBalloon;
    }

    public void grow() {
        _target.grow();
    }

    public void shrink() {
        _target.shrink();
    }

    public void setColor(java.awt.Color aColor) {
        _target.setColor(aColor);
    }
} // BalloonProxy
Question 2
Examine the given class definitions and answer the questions that follow:

```java
public class Person { }

public class Student extends Person {
    private Degree _degree;

    public Student() { }

    public void setDegree(Degree degree) { _degree = degree; }
}

public class HistoryStudent extends Student {
    public HistoryStudent() {
        this.setDegree(new BachelorOfArts());
    }
}

public class ChemistryStudent extends Student {
    public ChemistryStudent() {
        this.setDegree(new BachelorOfScience());
    }
}

public class Degree { }

public class BachelorOfArts extends Degree { }

public class BachelorOfScience extends Degree { }
```

Part a [15 marks]
For each of the following variable declarations and initializations, (i) state whether it is legal (“legal” or “illegal”), and (ii) explain your answer.

```java
Person p = new HistoryStudent();

HistoryStudent hs = new Student();

ChemistryStudent cs = new HistoryStudent();
```
Question 2, part b
Consider each of the following code fragments. In each case the variable declaration and initialization is legal. For each method call, (i) state whether it is legal (“legal” or “illegal”), and (ii) explain your answer.

```java
Student s = new Student();
s.setDegree(new BachelorOfArts());

Person pp = new Person();
pp.setDegree(new BachelorOfArts());

Person ps = new Student();
ps.setDegree(new BachelorOfArts());

HistoryStudent hs = new HistoryStudent();
hs.setDegree(new BachelorOfArts());
```
Question 3
Base your answer to this question on the following class diagram:

Part a

1. Give all classes involved in a has a relation. Make sure to tell who has a what.

2. Give all classes involved in a knows a relation. Make sure to tell who knows a what.

3. Give all classes involved in an is a relation. Make sure to tell who is a what.

4. Give all classes involved in an uses relation. Make sure to tell who uses what.
Question 3, part b
Write the code which implements the class named B to match the given UML diagram. Assume the constructor of C is used to establish the knows a relation with B.
This examination has 3 questions. Answer all 3 questions.

READ AND OBSERVE THE FOLLOWING RULES:

▷ Write the following, in ink, in the space provided above,
   ◦ your name, surname first,
   ◦ your usual signature,
   ◦ your UB person number, and
   ◦ your lab/recitation section.

▷ All of your writing must be handed in. This booklet must not be torn or mutilated in any way, and must not be taken from the examination room.

▷ Show all of your work in arriving at an answer, unless instructed otherwise. Partial credit will be awarded as appropriate.

▷ Candidates are not permitted to ask questions of the invigilators, except in cases of supposed errors or ambiguities in examination questions.

▷ CAUTION — Candidates guilty of any of the following, or similar, dishonest practices shall be immediately dismissed from the examination and shall be liable to disciplinary action.
   ◦ Making use of any books, papers or memoranda, calculators or computers, audio or visual cassette players, or other memory aid devices, other than those explicitly authorised by the examiners.
   ◦ Speaking or communicating with other candidates.
   ◦ Purposefully exposing written papers to the view of other candidates. The plea of accident or forgetfulness shall not be received.

<table>
<thead>
<tr>
<th>Question</th>
<th>Points</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>/24</td>
</tr>
<tr>
<td>2</td>
<td>/35</td>
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