1. Section 10 Exercises

- **Exercise 10-1**: What is the problem with the following solutions:
  - Each value is stored in a separate variable:
    
    **Difficult to manipulate / exchange all information about a student.**
  
  - Put all the values into an array:
    
    **The variables are not of the same type.**

OR

```
public class Student
{
    public int id;
    public double midterm;
    public double exam;
    public boolean forCredit;
}
```

**Program Memory**

**Exercise 10-2**: First Version of Student Class

**Working memory**

**Global Memory**

**CPU**
public class Section10
{
    public static void main(String [] args)
    {
        Student aStudent;
        aStudent = new Student( );
        aStudent.id = 1234567;
        aStudent.midterm = 60.0;
        aStudent.exam = 80.0
        aStudent.forCredit = true;

        Student meToo;
        meToo = new Student( );
        meToo.id = 1234567;
        meToo.midterm = 60.0;
        meToo.exam = 80.0
        meToo.forCredit = true;
    }
}
public class Student
{
    // Attributes
    private int id;
    private double midterm;
    private double exam;
    private boolean forCredit;
    private double finalMark;

    // Methods
    public int getId()
    { /* insert code here */ }
    public void setId( int newId )
    { /* insert code here */ }
    public double getMidterm()
    { /* insert code here */ }
    public void setMidterm( double newMark )
    { /* insert code here */ }
    public double getExam()
    { /* insert code here */ }
    public void setExam( double newMark )
    { /* insert code here */ }
    public boolean getForCredit()
    { /* insert code here */ }
    public void setForCredit( boolean newValue )
    { /* insert code here */ }
    public double getFinalMark()
    { /* insert code here */ }
    private void recalculateFinalMark()
    { /* insert code here */ }
}

} // end of class Student
public class Student
{
    // attributes and other methods would go here

    public void setMidterm( double newValue )
    {
        this.midterm = newValue;
        this.recalculateFinalMark();
    }

    public void setExam( double newValue )
    {
        this.exam = newValue;
        this.recalculateFinalMark();
    }

    private void recalculateFinalMark()
    {
        this.finalMark = 0.2 * this.midterm +
                     0.8 * this.exam;
    }
}