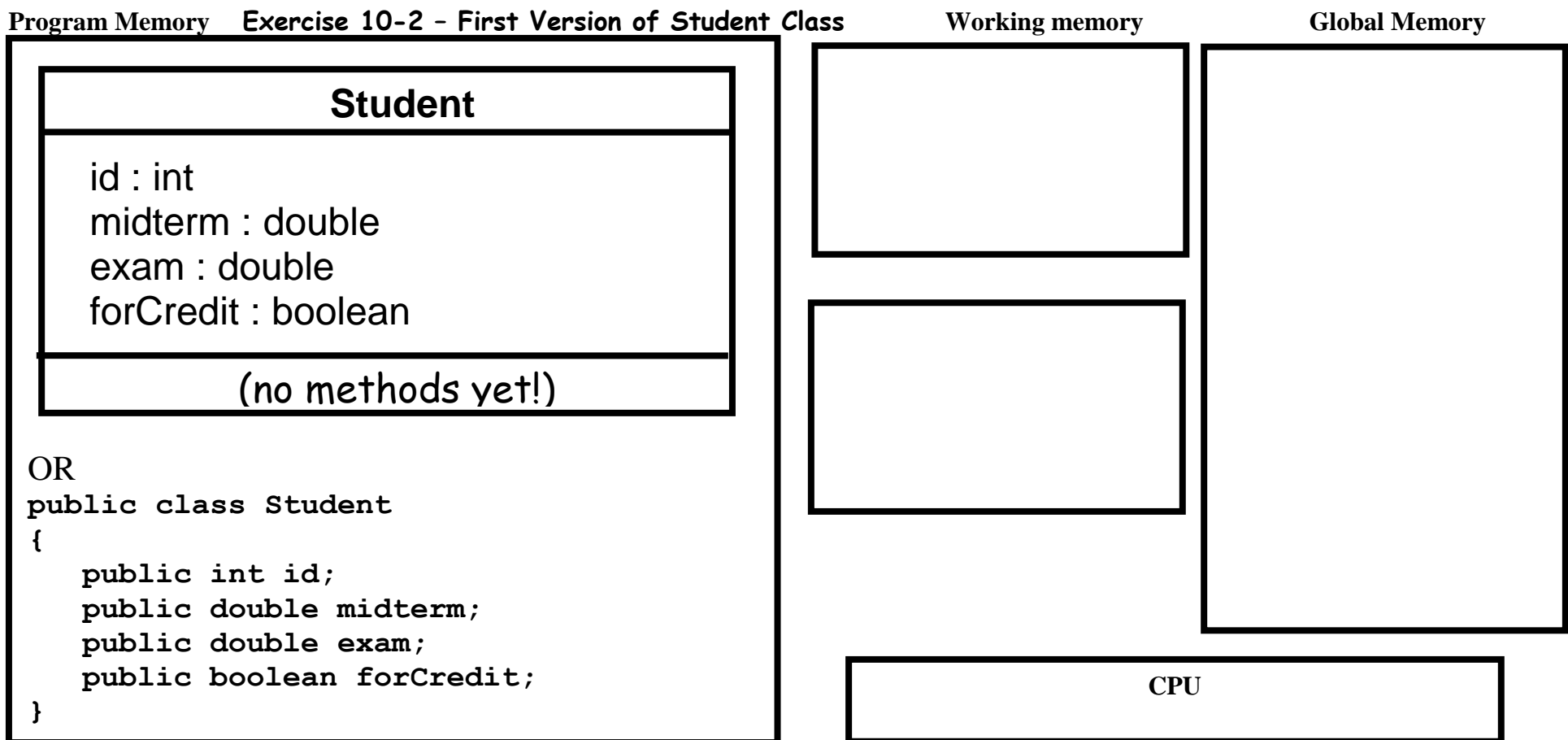


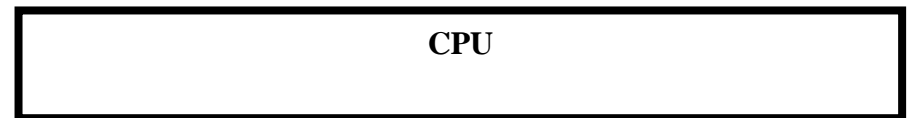
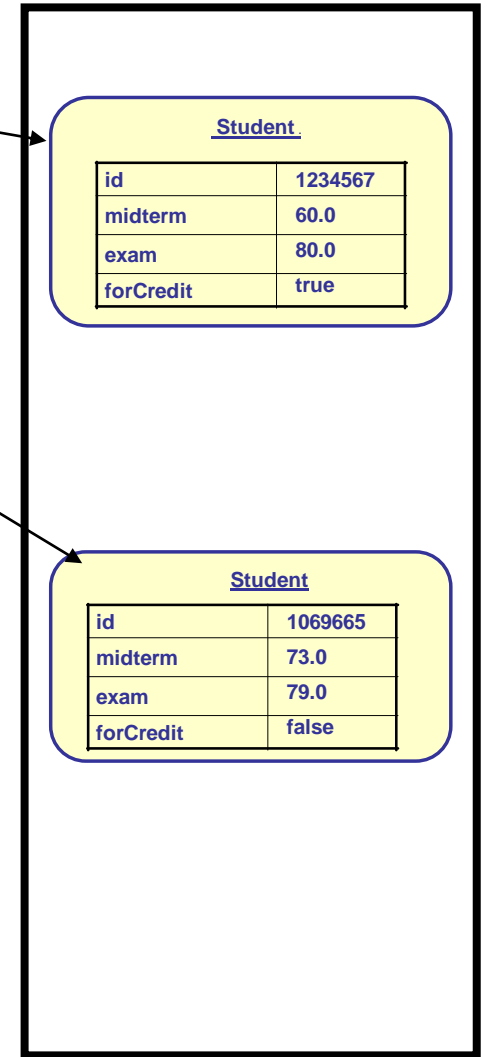
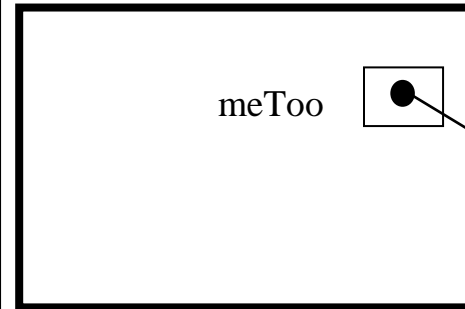
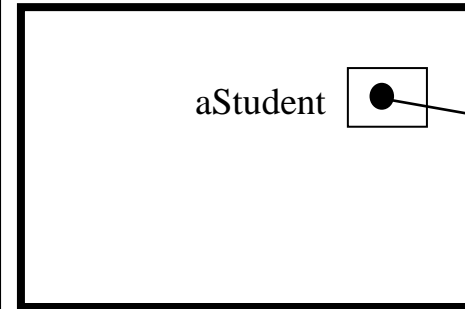
1. Section 10 Exercises

- **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.



```
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;
    }
}
```



Program Memory

Information Hiding in the Student Class

Working Memory

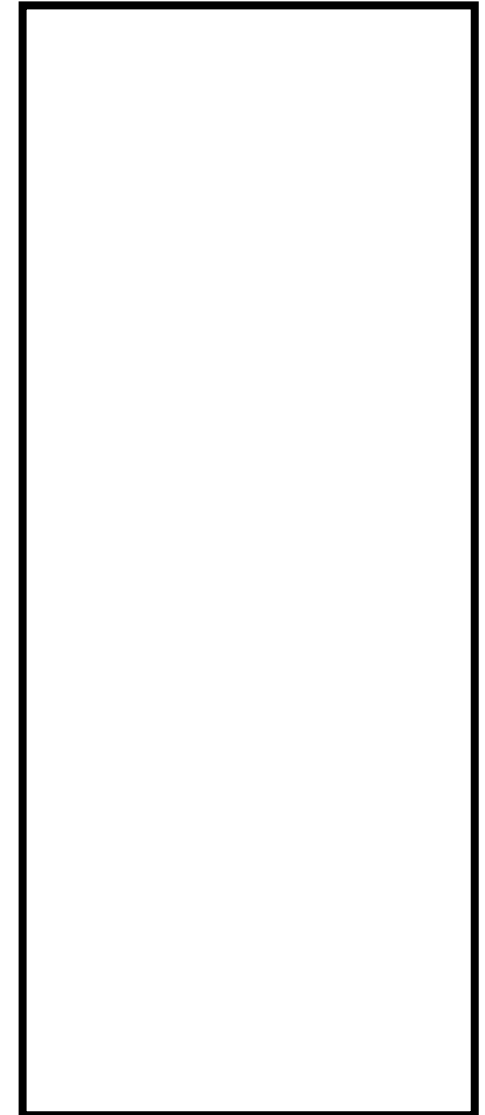
Global Memory

```
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
```



CPU

Program Memory

Methods in the Student Class

Working Memory

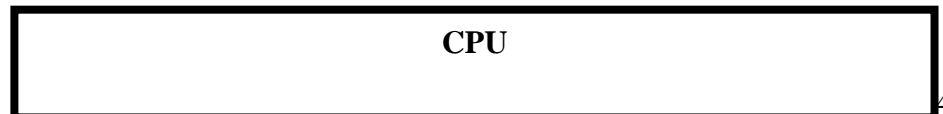
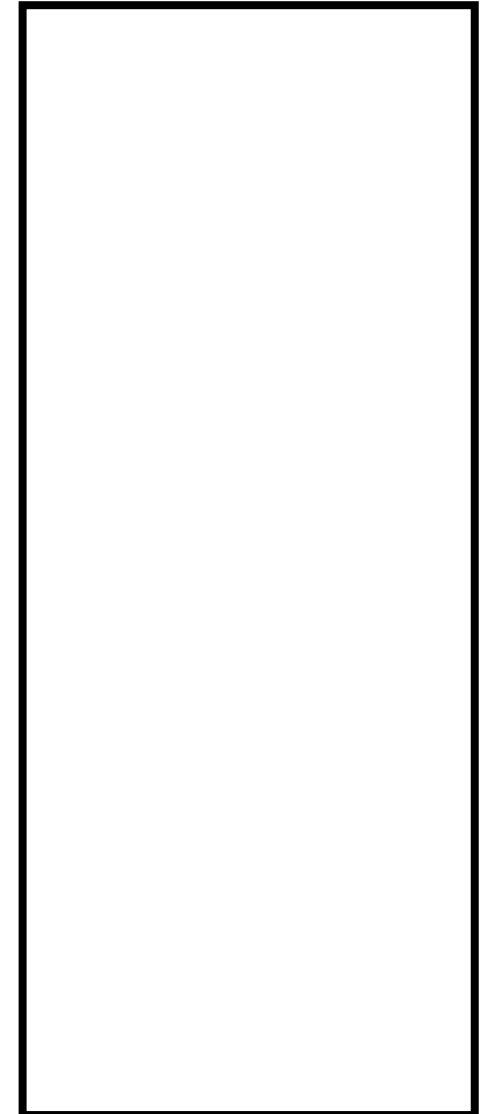
Global Memory

```
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;
}
}
```



CPU