APCS-B FR#4

1.  Assume that student records are implemented using the following object:

class studentInfo {

    //member variables:

    private String name;

    private int creditHours;

    private double gradePoints;

    private double GPA;

    //methods to return values

    public String getName() { return name;}

    public int getCreditHours() { return creditHours; }

    public double getGradePoints () {return gradePoints;}

    public double getGPA() {return GPA;}

    //Sets the value of GPA for this student

    pubic void setGPA(double gpa) {/\* implementation not shown \*/}

    public boolean isSenior() { /\* Part B \*/ }

    // Other public and private members not shown

}

The following object is used to maintain information about a list of student records.

class studentRecords {

    private ArrayList studentList;  // Contains studentInfo objects

    public void computeGPA() {/\* Part A \*/}

    public ArrayList seniorList() {/ Part C \*/}

    //other public and private data members not shown

}

a.  Write method computeGPA as started below.  computeGPA should fill in the GPA data member for the students contained within the ArrayList studentList.  A student's GPA (grade point average) is computed by dividing gradePoints by creditHours.  The GPA for a student with 0 credit hours should be set to 0.

Complete the method computeGPA below.  You may use any of the methods in the studentInfo object to write this method.

/\*\*

 \* computeGPA - this method calculates the grade point average for each

 \* student within the studentList data member, storing the results in the GPA

 \* member of studentInfo.

 \*\*/

public void computeGPA() {

b.  Write studentInfo member method isSenior, as started below.  isSenior should return true if the given student has at least 125 credit hours and has a GPA of at least 2.0; otherwise, isSenior should return false.

For example:

| Student |  |  |  | Result of Call to isSenior |
| --- | --- | --- | --- | --- |
| name | creditHours | gradePoints | GPA |  |
| King | 45 | 171 | 3.8 | false (not enough credit hours) |
| Norton | 128 | 448 | 3.5 | true |
| Solo | 125 | 350 | 2.8 | true |
| Kramden | 150 | 150 | 1.0 | false (GPA too low) |

Complete method isSenior below.

/\*\*

 \* isSenior - returns true if this student's credit hours >= 125

 \* and GPA >= 2.0; otherwise, returns false

 \*\*/

public boolean isSenior()

{

c.  Write the method seniorList, as started below.  seniorList determines which students in the array studentList are seniors and creates an arrayList of those records and returns it.

In writing seniorList, you may call method isSenior specified in part(b). Assume that isSenior works as specified regardless of what you wrote in part (b).

Complete method seniorList below.

/\*\*

 \* seniorList - returns an ArrayList containing the studentInfo

 \* records that meet the standards for being a senior as set aside in

 \* part B.

 \*\*/

public ArrayList seniorList()

{