3. Users of a website are asked to provide a review of the website at the end of each visit. Each review, represented by an object of the Review class, consists of an integer indicating the user's rating of the website and an optional String comment field. The comment field in a Review object ends with a period ("."), exclamation point ("!"), or letter, or is a String of length 0 if the user did not enter a comment.

```
public class Review
   private int rating;
   private String comment;
   /** Precondition: r >= 0
           c is not null.
    * /
   public Review(int r, String c)
      rating = r;
      comment = c;
   }
   public int getRating()
      return rating;
   public String getComment()
   {
      return comment;
   }
   // There may be instance variables, constructors, and methods that are not shown.
}
```

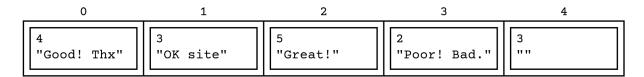
}

The ReviewAnalysis class contains methods used to analyze the reviews provided by users. You will write two methods of the ReviewAnalysis class.

```
public class ReviewAnalysis
    /** All user reviews to be included in this analysis */
   private Review[] allReviews;
    /** Initializes allReviews to contain all the Review objects to be analyzed */
   public ReviewAnalysis()
    { /* implementation not shown */ }
    /** Returns a double representing the average rating of all the Review objects to be
         analyzed, as described in part (a)
        Precondition: allReviews contains at least one Review.
            No element of allReviews is null.
     * /
   public double getAverageRating()
    \{ /* \text{ to be implemented in part (a) } */ \}
    /** Returns an ArrayList of String objects containing formatted versions of
        selected user comments, as described in part (b)
         Precondition: allReviews contains at least one Review.
             No element of allReviews is null.
        Postcondition: allReviews is unchanged.
   public ArrayList<String> collectComments()
    \{ /* \text{ to be implemented in part (b) } */ \}
```

GO ON TO THE NEXT PAGE.

(a) Write the ReviewAnalysis method getAverageRating, which returns the average rating (arithmetic mean) of all elements of allReviews. For example, getAverageRating would return 3.4 if allReviews contained the following Review objects.



Complete method getAverageRating.

```
/** Returns a double representing the average rating of all the Review objects to be
  * analyzed, as described in part (a)
  * Precondition: allReviews contains at least one Review.
  * No element of allReviews is null.
  */
public double getAverageRating()
```

Begin your response at the top of a new page in the Free Response booklet and fill in the appropriate circle indicating the question number.

If there are multiple parts to this question, write the part letter with your response.

```
Class information for this question

public class Review

private int rating
private String comment

public Review(int r, String c)
public int getRating()
public String getComment()

public class ReviewAnalysis

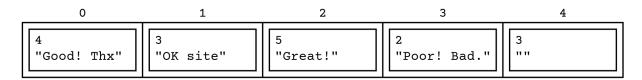
private Review[] allReviews

public ReviewAnalysis()
public double getAverageRating()
public ArrayList<String> collectComments()
```

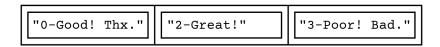
GO ON TO THE NEXT PAGE.

- (b) Write the ReviewAnalysis method collectComments, which collects and formats only comments that contain an exclamation point. The method returns an ArrayList of String objects containing copies of user comments from allReviews that contain an exclamation point, formatted as follows. An empty ArrayList is returned if no comment in allReviews contains an exclamation point.
 - The String inserted into the ArrayList to be returned begins with the index of the Review in allReviews.
 - The index is immediately followed by a hyphen ("-").
 - The hyphen is followed by a copy of the original comment.
 - The String must end with either a period or an exclamation point. If the original comment from allReviews does not end in either a period or an exclamation point, a period is added.

The following example of allReviews is repeated from part (a).



The following ArrayList would be returned by a call to collectComments with the given contents of allReviews. The reviews at index 1 and index 4 in allReviews are not included in the ArrayList to return since neither review contains an exclamation point.



Complete method collectComments.

- /** Returns an ArrayList of String objects containing formatted versions of
 - * selected user comments, as described in part (b)
 - * **Precondition**: allReviews contains at least one Review.
 - * No element of allReviews is null.
 - * **Postcondition**: allReviews is unchanged.

* /

public ArrayList<String> collectComments()

Begin your response at the top of a new page in the Free Response booklet and fill in the appropriate circle indicating the question number.

If there are multiple parts to this question, write the part letter with your response.

GO ON TO THE NEXT PAGE.