```java
1    /*Written by A Student for CS1301
2    On: Month, Day, Year
3    Purpose: Program passing input csv data file containing
4    measurements of rectangles into program to calculate
5    area and then return list of each rectangle with respective
6    length, width, and area measurements.
7    */
8    import CSCI.*;
9    import java.util.*;
10   public class GetArea
11   {
12       public static class rectangle //rectangle class, we create rectangle objects from
         this
13       {
14           int height;
15           int width;
16           int area; //properties of a rectangle
17       }
18
19       public final static int ERROR = 0; //error constant is declared
20       public final static String FORMAT = "  %6s =  %7d,  %5s =  %7d,  %4s =  %7d";
         //create format for output
21
22       public static void main (String[] args) //main method
23       {
24           String filename = args[0]; //file input is passed as a name in cmd argument 0
25           ArrayList<rectangle> rectangles = getMyRectangles(filename); //initialize
             arraylist where rectangles will be stored
26           String rectangleMeasurements; //initialize string to store rectangle measurements
27           int size = rectangles.size(); //size is the length of the rectangles arraylist
28           for(int i=0; i<size; ++i) //for the length of rectangles array list
29           {
30               rectangleMeasurements = parseMeasurements(rectangles, i); //take values
                 from arraylist and store them using parseMeasurements method
31               System.out.println(rectangleMeasurements); //print individual rectangle
                 measurements
32           }
33
34       } //end main
35
36       public static ArrayList<String> Reader(String filename) //file input and reader
         method
37       {
38          FileIn myFile = new FileIn(filename); //file input
39          ArrayList<String> input = new ArrayList<String>(); //create string arraylist
40          String line; //primer read
41          line = myFile.Read();
42          while (line != null) //while loop until end of file is reached
43             {
44                input.add(line); //place data into arrayList using add
45                line = myFile.Read(); //read next line
46             }
47          myFile.close(); //close file
48          return input; //return arraylist
49       }
50
51       public static ArrayList <rectangle> getMyRectangles(String filename) //arraylist
         creation method
52       {
53           ArrayList<rectangle> rectangles = new ArrayList<rectangle> ();
54           ArrayList<String> input = Reader(filename); //call reader method to build
             arraylist
55
56           int size = input.size();
57           String line;
58           rectangle myRect;
59           // loop through the list of Strings and
60          // decode them into myRect records.
61           for (int i = 0; i < size; i++)
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62            {
63                line = input.get(i); //line == height,width
64                myRect = decode(line); //break up the csv record into component parts using
                  decode method
65                rectangles.add(myRect); //add each rectangle object (myRect) to rectangles
                  arraylist
66            }
67            return rectangles; //return the rectangles arraylist
68        }
69
70        public static rectangle decode(String line) //method to decode read data into
           rectangle objects
71        {
72            String[] parts; //create a string array to store the parts of the data
73            rectangle myRect = new rectangle(); //create a new rectangle object
74            parts = line.split(","); // [0] = height [1] = width
75            myRect.height = CSCIConvert.Parse(parts[0],ERROR); //height
76            myRect.width = CSCIConvert.Parse(parts[1],ERROR); //width
77            myRect.area = computeArea(myRect.height, myRect.width); //call computeArea
               method to create area property for rectangle
78
79            return myRect; //return the new rectangle object named myRect
80        }
81
82        public static int computeArea(int height, int width) //area calculation method
83        {
84            int area = height*width; //take input height and width to calculate area of
               rectangle
85            return area; //return area after calculating
86        }
87
88        public static String parseMeasurements(ArrayList<rectangle> rectangles, int i)
           //string creation method for output of rectangle data
89        {
90            int size = rectangles.size(); //set size to length of rectangles arrayList
91            int height = 0;
92            int width = 0;
93            int area = 0; //initialize variables
94            rectangle rectangleObject; //instantiate rectangle object
95            String output = "NULL"; //default output string to string that says NULL
96                rectangleObject = rectangles.get(i);
97                height = rectangleObject.height;
98                width = rectangleObject.width;
99                area = rectangleObject.area; //set height, width, area to values of
                  rectangle at each index
100               output = String.format(FORMAT,"Height",height,"Width",width,"Area",area);
                  //create formatted output string
101                   return output;  //return output string
102        }
103   }
```