**Lab 6.** This is a continuation of Lab 5. You will be working with the same input file: shopping\_data.txt. In Lab 5, you found the frequent item sets with support of 0.01 or higher. In this lab, you will implement the Apriori algorithm to extract association rules from the frequent item sets. Extract only those rules where confidence >= 0.99. Expected output:

[[32, 45]->[16], [17, 29]->[47], [29, 47]->[17], [23, 41]->[24], [7, 11, 45]->[37], [7, 37, 45]->[11], [11, 37, 45]->[7], [12, 31, 48]->[36], [12, 36, 48]->[31], [31, 36, 48]->[12], [23, 24, 40]->[41], [23, 40, 41]->[24], [24, 40, 41]->[23], [23, 24, 43]->[40], [23, 40, 43]->[24], [24, 40, 43]->[23], [23, 24, 43]->[41], [23, 41, 43]->[24], [24, 41, 43]->[23], [23, 40, 43]->[41], [23, 41, 43]->[40], [40, 41, 43]->[23], [24, 40, 43]->[41], [24, 41, 43]->[40], [40, 41, 43]->[24], [23, 24, 40, 43]->[41], [23, 24, 41, 43]->[40], [23, 24, 43]->[40, 41], [23, 40, 41, 43]->[24], [23, 40, 43]->[24, 41], [23, 41, 43]->[24, 40], [24, 40, 41, 43]->[23], [24, 40, 43]->[23, 41], [24, 41, 43]->[23, 40], [40, 41, 43]->[23, 24]]

**Design considerations (Very general, you will need to add more methods)**

Create a new Rule class. It should contain the following data to store the left and right side of a rule.

ItemSet left, right;

Add appropriate methods to the class, including equals method.

Add the main method to the Lab6.java class. In addition to Lab5 variables, you will have the following variable to store the result.  
  
ArrayList<Rule> rules

Add the following method that takes as input a frequent itemset and generates all association rules that can be extracted from it.

public static ArrayList<Rule> split(ItemSet itemSet)

I also created the following methods (among others):

public static void generateRules() //generates all the rules.  
public static boolean isMinConfidenceMet(Rule r) //checks if rule meets minimum confidence