University of the People

Programming-2

Solutions for Assignment Unit 2

package SimpleRandomSentences\_solution.java;  
/\*     
  Some rules that capture the syntax of this verse:  
     
    <sentence> ::= <simple\_sentence> [ <conjunction> <sentence> ]

    <simple\_sentence> ::= <noun\_phrase> <verb\_phrase>

    <noun\_phrase> ::= <proper\_noun> |  
                      <determiner> [ <adjective> ]. <common\_noun> [ who <verb\_phrase> ]

    <verb\_phrase> ::= <intransitive\_verb> |  
                      <transitive\_verb> <noun\_phrase> |  
                      is <adjective> |  
                      believes that <simple\_sentence>

    <conjunction> ::= and | or | but | because

    <proper\_noun> ::= Fred | Jane | Richard Nixon | Miss America

    <common\_noun> ::= man | woman | fish | elephant | unicorn

    <determiner> ::= a | the | every | some

    <adjective> ::= big | tiny | pretty | bald

    <intransitive\_verb> ::= runs | jumps | talks | sleeps

    <transitive\_verb> ::= loves | hates | sees | knows | looks for | finds

    This program implements these rules to generate random sentences.  All the  
    verses of the rhyme can be generated, plus a lot of sentences that make no  
    sense (but still follow the syntax).   Note that an optional item like  
    [ <modifier> ] has a chance of being used, depending on the value of some  
    randomly generated number.  
   
    The program generates and outputs one random sentence every three seconds until  
    it is halted (for example, by typing Control-C in the terminal window where it is  
    running).  
\*/

public class SimpleRandomSentences {

   static final String[] conjunction = { "and", "or", "but", "because"};  
                                    
   static final String[] proper\_noun = { "Fred", "Jane", "Richard Nixon","Miss America"};

   static final String[] common\_noun = { "man", "woman", "fish", "elephant", "unicorn"};                                    
    
   static final String[] determiner = { "a", "the", "every", "some"};  
    
   static final String[] adjective = { "big", "tiny", "pretty", "bald"};  
    
   static final String[] intransitive\_verb = { "runs", "jumps", "talks", "sleeps"};  
    
   static final String[] transitive\_verb = { "loves", "hates", "sees", "knows", "looks for", "finds"};  
    
   public static void main(String[] args) {  
      while (true) {  
         randomSentence();  
      System.out.println(".\n\n");  
         try {  
             Thread.sleep(3000);  
         }  
         catch (InterruptedException e) {  
         }  
      }  
   }  
    
   static void randomSentence() {  
      randomNounPhrase();  
              randomVerbPhrase();  
      if (Math.random() > 0.75) {  
              System.out.print(" " + randomItem(conjunction));  
              randomSentence();  
      }  
   }  
    
   static void randomNounPhrase() {

          if (Math.random() > 0.75)  
             System.out.print(" " + randomItem(proper\_noun));  
          else  
          {  
             System.out.print(" " + randomItem(determiner));  
             if (Math.random() > 0.5)  
         System.out.print(" " + randomItem(adjective)+".");  
                System.out.print(" " + randomItem(common\_noun));  
                 if (Math.random() > 0.5){  
                      System.out.print(" who" );  
                      randomVerbPhrase();  
                 }  
          }  
     }  
    
      static void randomVerbPhrase() {  
                    
          if (Math.random() > 0.75)  
             System.out.print(" " + randomItem(intransitive\_verb));  
                else if (Math.random() > 0.50) {  
                        System.out.print(" " + randomItem(transitive\_verb));  
                        randomNounPhrase();  
                }  
                else if (Math.random() > 0.25)  
                    System.out.print(" is " + randomItem(adjective));  
                else {  
                    System.out.print(" believes that");  
                    randomNounPhrase();  
                    randomVerbPhrase();  
                }  
       }  
    
   static String randomItem(String[] listOfStrings){  
       return listOfStrings[(int)(Math.random()\*listOfStrings.length)];  
   }

}