Consider two threads calling the getHelper() method in parallel:
1) Can you construct a possible data race if they call the unoptimized version of getHelper() in lines 3-8?

2) Can you construct a possible data race if they call the optimized version of getHelper() in lines 12-21?

3) How will your answer to 2) change if the helper field in line 11 was declared as volatile?

Worksheet #36 (contd)

1. class Foo { //unoptimized version
   2. private Helper helper; // Singleton pattern
   3. public synchronized Helper getHelper() {
   4.      if (helper == null) {
   5.         helper = new Helper();
   6.      }
   7.      return helper;
   8.   }
   9.   ...

10. class Foo { //Optimized version
   11. private Helper helper; // Singleton pattern
   12. public Helper getHelper() {
   13.      if (helper == null) {
   14.          synchronized(this) {
   15.             if (helper == null) {
   16.                helper = new Helper();
   17.             }
   18.          }
   19.      }
   20.      return helper;
   21.   }
   22.   ...