

## Java Threading Exercises

1. Write two java thread programs to display Symmetrical and Inverted Rangoli pattern one at a time as shown on the command line

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      **                     *****
      ***                    *****
      ****                  *****
      *****               *****
      *****             *****
      *****          *****
      *****        *****
      *****      *****
      *****    *****
      *****  *****
      ***** *****

```

and

- Execute these threads individually and then in second stage run both of them as child threads by passing System.out as common shared object to print from parent program. Synchronize the access to System.out to get proper print of characters on cmd line.
2. In second application modify above threads to have communicate by using wait and notify with synchronized access to System.out from parent process.
  3. Define two threads one for writing even numbers and one for writing odd numbers at interval of 2 seconds on console. Using these two threads print numbers till 100 in a sequence. Use synchronized blocks in threads.
  4. Define a List containing employee information (name, age, salary, address) and share this across two threads one to read with iterator and other thread to add/remove records by intervals. Provide proper synchronization and monitor the iterator in first thread for any exceptions.
  5. In new application for above thread in No3 modify first thread to add and remove records during iterator phase in the list. Control the errors in other thread which is reading with intervals.
  6. Define a User class with synchronized operations for updateUser and readUser methods .Inside updateUser access the readUser and in readUser access the updateUser methods to create deadlocks with two different threads to access those get and set operations. Provide console print messages with intervals of 2 sec to display progress. Anylze the deadlock with thread dumps.

7. Define two threads one to add records in shared list and other to remove duplicates from the shared list. Use proper synchronization.

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