IIP

Test Unit 7

Year 2012-2013

Name:

1. The value e^x can be approximately calculated by using the series $e^x = \sum_{i=0}^{\infty} \frac{x^i}{i!}$. The strategy consists of generating each of the terms of the series and accumulating them into a var, until the last generated term is small enough. Moreover, notice that each term can be generated from the previous one, except the first one whose value is 1.

   Write a Java static method that given a real value x and a small real value *epsilon* (*epsilon* > 0), calculates, using the iteration described in the previous strategy, the value e^x, by summing all the generated terms until the last calculated value is lower than *epsilon*.

```
public static double exp(double x, double eps) {
  double e=0, t=1;
  int i=1;

  while (t>eps) {
    e+=t;
    t=t*x/i;
    i++;
  }

  return e;
}
```

2. A palindrome is a word that has the same lecture from the beginning to the end and from the end to the beginning; for example, “radar”, “redivider”, “rotator”, and “kayak” are palindromes (among many others). Write a Java static method that receives a `String` that stores a word and returns if it is or not a palindrome.

```
public static boolean palindrome(String w) {
  int b=0, e=w.length()-1;
  while ( (b<e) && (w.charAt(b)==w.charAt(e)) ) { b++; e--; }
  return (e<=b);
}
```

3. Write a Java program class whose `main` method shows on the screen the following figure, by using spaces and asterisks.

```
     **
    ****
   ******
  ********
 **********
```

The number of asteriks of the last line must be asked to the user.

```
import java.util.*;

public class Triangle {
  public static void main(String [] args) {
    Scanner kbd=new Scanner(System.in).useLocale(Locale.US);
    int i, j, n;

    n=kbd.nextInt();
    if (n%2==1) n--;

    for (i=2;i<=n;i+=2) {
      for (j=0;j<(n-i);j++) System.out.print(" ");
      for (j=0;j<i;j++) System.out.print("*");
      System.out.println();
    }
  }
}
```