Due in class: Wednesday, May 9, 2012

**Problem 1** Write a Ruby program that takes an integer $n$ as input and prints the following pattern (the pattern shown is for $n = 4$):

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

**Project 2.** Write a Ruby program to print out all “perfect” numbers between 1 and 10000. A “perfect” number is a positive integer that is equal to the sum of all its positive factors excluding itself.

For example, 6 is a perfect number. The factors of 6 excluding itself are 1, 2, and 3, and $6 = 1 + 2 + 3$.

**Project 3.** Research the contributions of Alan Turing to modern computer science, and write a short description.

**Project 4.** Why do you think the class of problems called NP is interesting?