

Challenging Projects

(Due on Tuesday, 10/25/2011 at Moodle)

Your name:	Score:
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Important Notice:

1. *No* late submission will be accepted!!
2. You must submit your work at Moodle.
 - Only source code is needed (do NOT submit files of other types).
 - Use meaningful file (i.e., Java class file name) for each project---for most of the projects only one class file for each project.
 - You must use Command Line to compile and run the Java code (i.e., with commands “javac xxx.java” and “java xxx” to compile and run.
3. How to Grade:
 - Each question/project is worth 0.5 point (half point) unless indicated otherwise.
 - The Challenging Projects points will be added to your overall final grade.
 - I may ask you some questions about your design and implementation regarding your submission (so that your submissions are 100% your own work rather than a simple “combination” of online materials—there are a lot, just try searching!!).
 - *Completion of 3 or more projects in this assignment will automatically earn 100% grading for your both Assignment01 and Assignment02.*

CH01: Write an application that inputs an integer containing only 0s and 1s (i.e., a binary integer) and prints its decimal equivalent. [Hint: Use the remainder and division operators to pick off the binary number’s digits one at a time, from right to left. In the decimal number system, the rightmost digit has a positional value of 1 and the next digit to the left has a positional value of 10, then 100, then 1000, and so on. The decimal number 234 can be interpreted as $4 * 1 + 3 * 10 + 2 * 100$. In the binary number system, the rightmost digit has a positional value of 1, the next digit to the left has a positional value of 2, then 4, then 8, and so on. The decimal equivalent of binary 1101 is $1 * 1 + 0 * 2 + 1 * 4 + 1 * 8$, or $1 + 0 + 4 + 8$ or, 13.] (for example, if the input is “10011” the output will be 19).

CH02: Write an application that computes the value of e^x by using the formula $= 1 + x/1! + x^2/2! + x^3/3! + x^4/4! + \dots x^n/n!$ for given x (double) and n (integer) according to the following:

- $n! = 1 * 2 * 3 * 4 * \dots * n$ (i.e., factorial).
- In your code, you may *not* use any Java system class/methods for the calculation of factorial and/or exponential/power operations (the only arithmetic operations you may use are: multiplication, addition, division, subtraction).
- You may not use nested loops (so the operations will be with $O(n)$).

CH03—Game *Knight's Tour* (3 points): questions 7.22 and 7.23 on pages 304~306 from the textbook.

CH04—Game *Eight Queens* (1.5 points): question 7.24 on pages 306~307 from the textbook.