Homework 4 − Due Thursday, February 14, 2008 <u>by 11:59am</u> in Sofya's office

Please refer to the general information handout for the full homework policy and options.

Page limit   You can submit **at most** 1 page per problem, even if the problem has multiple parts. If you submit a longer solution for some problem, only the first page will be graded. This homework contains 4 problems, worth 10 points each.

Reminder   Collaboration is permitted, but you must write the solutions *by yourself without assistance*, and be ready to explain them orally to the instructor if asked. You must also identify your collaborators. Getting solutions from outside sources such as the Web or students not enrolled in the class is strictly forbidden.

Exercises   Please practice on solved exercises and problems in Chapter 3,4. The material they cover may appear on exams.

Problems

1. (k-**PDA**) Book, 3.9

2. (**Closure properties**) Show that the class of decidable languages is closed under

    (a) complement
    (b) concatenation

    Think about union (solution on p. 163) and intersection on your own.

    Show that the class of Turing-recognizable languages is closed under

    (c) intersection
    (d) star

    Think about union[1] and concatenation on your own.

3. (**Decidable iff enumerable in lexicographic order**) Book, 3.18

4. (EQ_{DFA} **is decidable**) Book, 4.16

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[1] In the solution on p. 163, the last paragraph should begin "If either M_1 or M_2 accepts w, ...".