

**Assignment 1, Constraint Satisfaction (CC484), 2006-07**  
**Set by Edward Tsang, University of Essex**

**1. Introduction:**

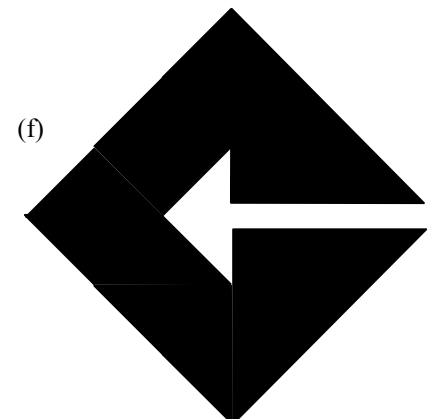
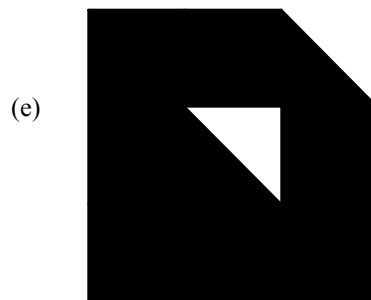
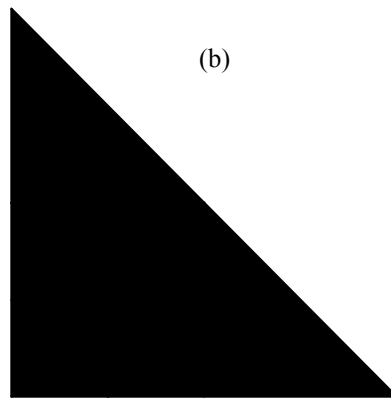
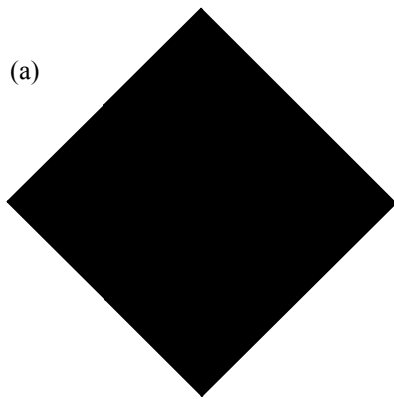
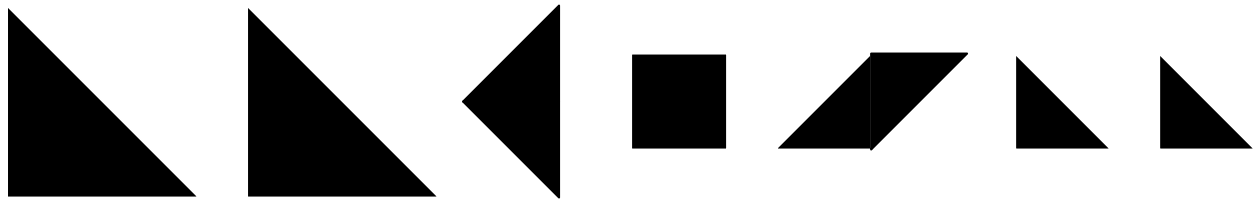
This assignment accounts for 10% of your total marks in this course. This assignment should be submitted electronically. The deadline of this assignment is *23:59, Wednesday 8 November 2006*.

**2. Objective:**

The objective of this assignment is to give you a chance to formulate a constraint satisfaction problem.

**3. The Tangram:**

Given the following seven pieces and a given shape to create, the task is to find out how to arrange the pieces. (a) to (f) show six possible shapes to create. You should concentrate on creating convex shape, such as those shown in (a) to (c), only. There is no need to handle non-convex shapes, such as those shown in (d) to (f), unless you want to.



**4. Your task:**

Formulate the above problem as a constraint satisfaction problem. You must state clearly what the variables, domains and constraints are;

**5. Submission requirements:**

Write your name clearly on the first page of your submission. Underline your surname.

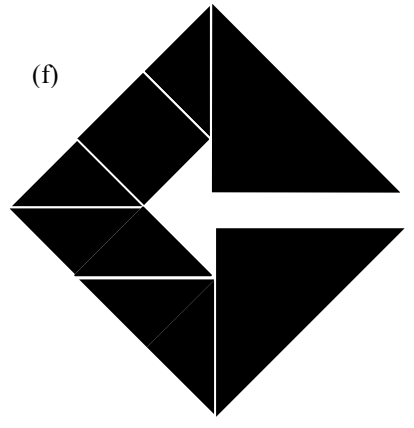
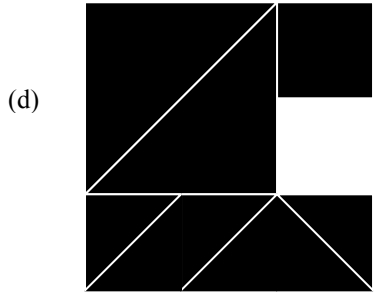
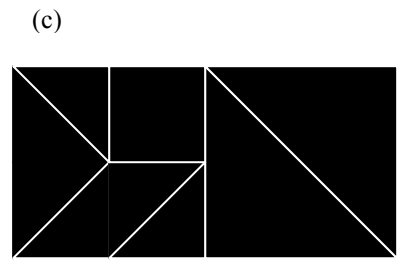
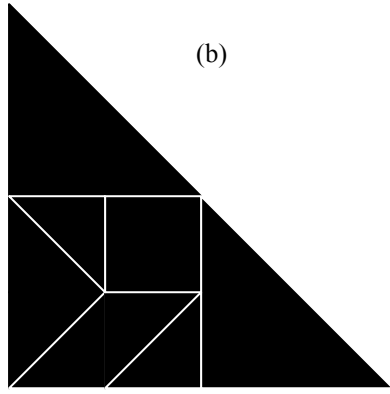
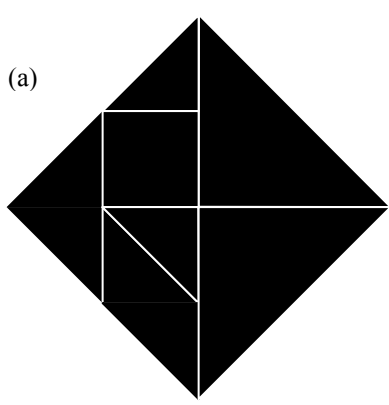
Submit a report of strictly no more than 1,000 words, stating your formulation of this problem. State precisely the variables, domains and constraints. Clearly explain how you arrive at your formulation. State clearly where you have used domain knowledge. Evaluate the size of your search space.

**6. Assessment criteria for this assignment:**

Correctness in formulation is the main criteria for evaluating your report. It is important that you explain carefully the way you approach the problem. You should state the constraints as clearly as possible.

**7. Please refer to the Student's handbook on the Departmental Policy on Plagiarism and Late Submission**

**Appendix: Solution to the given puzzles:**



**Assignment 2, Constraint Satisfaction (CC484), 2006-07**  
**Set by Edward Tsang, University of Essex**

**1. Introduction:**

This assignment follows from Assignment 1. It accounts for 10% of your total marks in this course. This assignment should be submitted electronically. The deadline of this assignment is *23:59, Thursday 7 December 2006*.

**2. Objective:**

The objective of this assignment is to let you implement a simple genetic algorithm for solving the constraint satisfaction problem that you have formulated.

**3. Your task:**

Implement a simple algorithm to solve the Tangram problems shown in assignment 1. Your program must be able to solve problems (a) to (c). Extra marks will be given to programs that can solve problems (d) to (f).

**4. Programming language and programming platform:**

You may use Prolog, Lisp, C, C++, Java, C-Sharp or Basics for implementation. To enable me to run your program, it must run in our labs.

**5. Submission requirements:**

Write your name clearly on the first page of your submission. Underline your surname.

You should submit:

- a) Your programs, in both source code and compiled code if applicable;
- b) A report, showing how your program should be run and output of your program. The format of the input must be clearly stated. Your script should show any information that helps others to understand how your algorithm works, and how efficient or otherwise it is.
- c) A report of no more than two A4 pages (font size 11), stating clearly how your program works. Give your evaluation of (i) the efficiency and (ii) the robustness of your program. Report any limitations of your program.

**6. Assessment criteria for this assignment:**

You are only expected to produce a basic backtracking algorithm. However, bonus will be given to more complex algorithms implemented. Correctness is most important. Marks will also reflect the tidiness and elegance of your program. Marks will also reflect the readability of the program and its output, which should be clear but concise.

**7. Please refer to the Student's handbook on the Departmental Policy on Plagiarism and Late Submission**