Submit a typed report. You do not need to submit code but you may be asked to e-mail the code or its input and output.

Groups are not allowed.

**Part 1**

Select a non-trivial combinatorial optimization problem for which an optimal solution can be found in polynomial time using dynamic programming. Describe the problem formally and informally. Use an example to illustrate the description.

**Part 2**

State and prove the property that is the basis for a dynamic programming solution. Describe the algorithm formally and informally with the help of an example.

**Part 3**

Write a program for implementing the algorithm you described in Part 2. Run your program on randomly generated instances of different sizes. Submit the results in table form. The table should be concise but representative.