Sixth problem set

Due date: 2019.04.04, 9.00

Topic: permutation representation

You have to send your solutions via email (evolalghf@gmail.com). You have to solve them unassisted, unless it's marked with a star. The problems marked * can be solved in groups of two. You can get maximum 10 points.

1. (2 points) Calculate the probability, that if we choose two random permutation as parents, then the CX operator produces

   (a) 1 cycle

   (b) n cycles, where n is the length of the permutations.

2. (4 points) Is it possible for any of the four crossover operators (PMX, EX, CX, OX), that if we exchange the order of the two, not identical parents, that the offspring are identical?

3. (2+2 points) For the EX operator why did we choose the vertex with the shortest edge-list to be the next vertex? Is it true, that if both parents have a common edge in their edge-list, then the offspring always has it in its edge list?

4. (10 points)* Write a program to solve the Traveling Salesman problem using a genetic algorithm. Use permutation representation, EX crossover and inversion mutation. The test-problem should be the one you designed on the last lecture.