- Problems
  - Travelling salesman problem (TSP).
  - The assignment problem.
  - Set covering.
  - Feedback arc-set (FAS).
  - Graph partitioning (GP).
  - Maximum Clique and Independent set.
  - Vertex colouring.
  - Edge-colouring.
  - Vertex cover.
  - Max k-satisfiability (even max 2-SAT is NP-hard).
  - Minimum spanning strong subdigraph and minimum spanning 2-edge-connected subgraph.
  - Minimum maximum degree spanning trees.
  - Knapsack, Bin packing and cutting steel plates.
  - The travelling tournament problem.
- Neighbourhoods
  - 1-opt, 2-opt, k-opt for TSP, GP, QAP, FAS etc
  - Eksponential neighbourhoods for TSP via minimum weight matching:
    1. Given tour $v_1u_1v_2u_2\dots v_ku_kv_1$ with cost function c on the edges.
    2. Form a complete bipartite graph G with partition $V = \{v_1, v_2, \dots, v_k\}$ and $U = \{u_1, u_2, \dots, u_k\}$.
    3. Assign the weight $c(v_iu_j) + c(u_jv_{i+1})$ to the edge v_iu_j for $1 \leq i, j \leq k$ indices are modulo k.
    4. Find a minimum weight perfect matching M in G in polynomial time.
    5. Let π be the permutation so that $M = \{v_1u_{\pi(1)}, v_2u_{\pi(2)}, \dots, v_ku_{\pi(k)}\}$
    6. Take $v_1u_{\pi(1)}v_2u_{\pi(2)}\dots v_ku_{\pi(k)}v_1$ as the new tour.
    7. Repeat the procedure above
  - Pyramidal tours for TSP: these have the form $v_1v_{i_1}v_{i_2}\dots v_{i_r}v_nv_{j_1}v_{j_2}\dots v_{j_{n-r-2}}$. Where $i_1 < \dots < i_r$ and $j_1 > \dots > j_{n-r-2}$. The best pyramidal tour can be found on polynomial time using dynamic programming.
  - Kempe chains for colouring problems