|  |
| --- |
| *THE TASK* |
| *The task is based on the two-dimensional strip packing problem* *(see, for instance, Lodi, A. et al. “Two-dimensional packing problems: A survey.” Eur. J. Oper. Res. 141 (2002)), which assumes that there is a single standardized unit of a given width, and the objective is to pack all of the given items so that the height of the yielding unit will be minimal.*  ***Task description***  If there is a unit of some width and number of items of predefined widths and heights, pack all of the given items so the height of the yielding unit will be minimal. Formalize the description of the problem, write a program that solves it, and provide information about the time complexity of the solution.  **Input Data:** Width of the unit, number of items, as well as their widths and heights.  **Output Data:** A program that finds the solution to the problem for the specified input data. The program returns the optimal packing for the listed items and shows a diagram of the solution.  **Notes**: An algorithm that finds the optimal solution to the problem has to be written in C++. The results of the tasks must be organized as a short report that has the following structure: (1) *Introduction* that provides information about the given problem and the input data; (2) *Problem Description* that provides information on the initial formulation; (3) *Implementation* that shows implementation details; (4) *Results* that provides information on the main results of the optimization procedure as well as on the time complexity of the provided solution; (4) *Conclusion* that summarizes the results. |