

Exercises II.

Exercise 1.

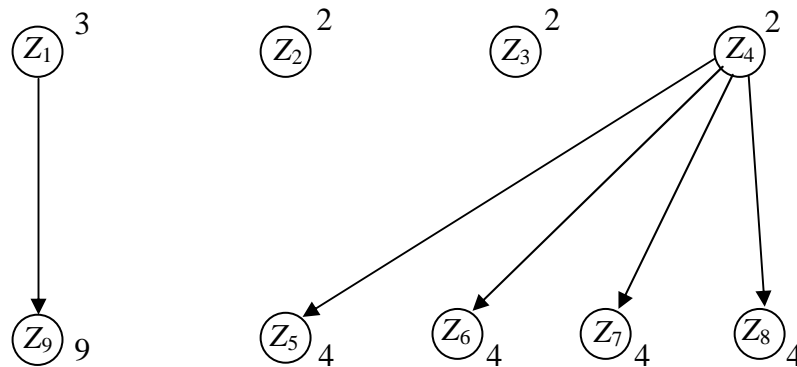
Use the LPT algorithm to schedule $P2||C_{\max}$ problem with five tasks, where execution times are $(3,3,2,2,2)$. Compare the resulting solution with an optimal one.

Exercise 2.

Solve Exercise 1 for three processors, $n=7$ and execution times $(5,5,4,4,3,3,3)$.

Exercise 3.

Consider $P3|prec|C_{\max}$ problem with $n=9$ tasks, where processing times are $(3,2,2,2,4,4,4,4,9)$. Precedence constraints are given by the following graph:



We use list scheduling algorithm with a list sequence coincident with the tasks numbering.

- Find a schedule obtained by list scheduling.
- Increase the number of processors to 4.
- Decrease the processing times by 1.
- Remove the following precedence constraints: (z_4, z_5) and (z_4, z_6) .

Exercise 4.

Prove that the problem $1|r_j, C_j \leq d_j|$ is NP-hard.

Exercise 5.

Show that the problem considered in Exercise 4 becomes polynomial-time solvable if $p_j=1$. Use a reduction to the problem of graph-matching.

Exercise 6.

Schedule $P3|p_j=1,in-tree|C_{\max}$ problem with precedence constraints given by the following graph:

