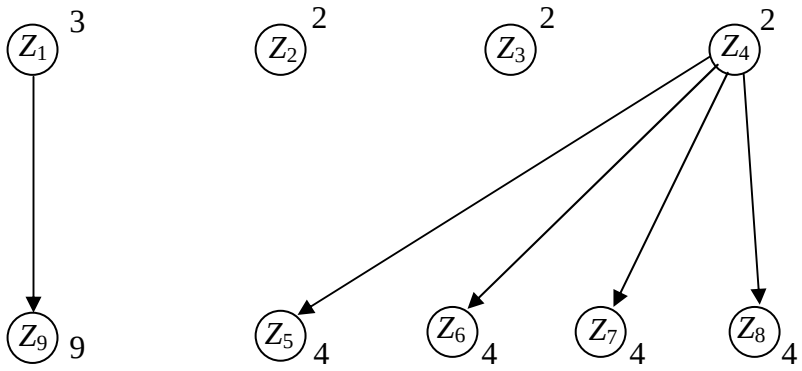
Exercises II.

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