Exercises III.

Exercise 1.
You have to save nine files of lengths (1,9,2,8,3,7,4,6,5) to a magnetic tape to minimize the mean access time to a file (every seek starts from the beginning of the tape). What is the value of the mean access time?

Exercise 2.
Complete the proof of NP-hardness of $P2||\Sigma w_i C_i$ presented in the lecture.

Exercise 3.
Use the LPT and the RPT algorithm for m=3 machines, n=7 tasks with processing times (7,6,5,5,4,3,3). Find a schedule with the optimum ΣC_j . Compare the values of the mean flow time.

Exercise 4.
Use Liu algorithm for single processor scheduling of n=6 preemptive tasks with r=(0,1,2,1,0,3), d=(3,2,4,3,7,11) and p=(2,3,2,4,2,4). Describe the problem in the 3-field notation. Derive the maximum lateness.

Exercise 5.
Solve the above problem for non-preemptive tasks with every release time r_i=2. Construct a schedule minimizing the maximum lateness. Does this schedule minimize the mean flow time?

Exercise 6.
Solve $1|in\text{-}tree,p_j=1|L_{max}$ problem and compute L_{max}* for n=7 tasks with due dates d=(7,7,6,5,1,7,5), where the precedence constraints are given by the following in-tree: