ISYE 474/574 Scheduling and Logistics (Spring 2026)
Assignment 1

Work individually. You do not have to typewrite your solution. Show all your work. Write legibly and staple all the pages before submission.

1. Consider the following problem as an instance of the $1|\text{ chain }|\sum w_j C_j$. Assume that the jobs in a chain are to be processed together. Find the optimal solution.

Jobs	1	2	3	4	5	6	7
p_j	3	6	6	5	4	8	10
w_j	6	18	12	8	8	17	18

$$1 \to 2 \to 5 \to 6$$
$$3 \to 4 \to 7$$

2. Assume the data from problem 1. But now if the chain can be broken, find the optimal solution.

3. Consider the following problem as an instance of the $1|\text{ prmp}, r_j|\sum C_j$. Find the optimal solution.

Jobs	1	2	3	4	5	6	7
p_j	3	6	8	5	4	8	10
r_j	2	0	0	2	10	10	10

4. Find all optimal sequences for the instance $1||h_{max}$ with the following jobs.

Jobs	1	2	3	4	5	6	7
p_j	4	8	12	7	6	9	9
$h_j(C_j)$	$3C_1$	77	C_3^3	$1.5C_4$	$50+\sqrt{C_5}$	$1.6C_6$	$1.4C_7$

5. Consider $1|prec|h_{max}$ with the same set of jobs in problem 4 and the following precedence constraints.

$$1 \to 5 \to 6$$
$$4 \to 7$$
$$2 \to 7$$

6. Student in ISYE 574 alone respond to this question. Show SRPT is optimal for $1|\text{ prmp}, r_j|\sum C_j$.