

Decision Models B6015 Homework Solution (1)

Question 1:

Decision Variable:

The amounts of influence that should be exercised by senators, i.e., **B18:J26**

Objective Function:

Maximize the total influence received by Sn. Kennedy, i.e., **B31**
(which equals **J27 = SUM(J18:J26)**)

Constraint:

Each senator should not send or received more influence than specified by the given influence rating table, the inflow from a member equals to the outflow from this member , and can not give more influence than he gets.

B18:J26 \leq **B5:J13** (Constraints of influence rating table)

B18:J26 \geq 0 (Nonnegativity for all variables)

B29:J29 = 0 (Inflow = Outflow for each senator)

Question 2:

(a)

The assignment of jobs to minimize the total hours is:

Job 1 → Person 2

Job 2 → Person 1

Job 3 → Person 5

Job 4 → Person 4

The minimum hours required is **75**.

(b)

If person #3 has called in sick, it will **not affect the optimal solution** above as person #3 has not been assigned a job anyway.

(c)

If Person #2 can no longer perform job #1, we can rebuild the original time-table without assigning the cell of "Person1 to Job1". The minimum time to complete the four jobs rises to **79** hours. The assignment of jobs then goes to:

Job 1 → Person 4

Job 2 → Person 3

Job 3 → Person 5

Job 4 → Person 1