(Touché Young) Three professors must be assigned to teach six sections of finance. Each professor must teach two sections of finance, and each has ranked the six time periods during which finance is taught, as shown in the file **P05_65.xlsx**. A ranking of 10 means that the professor wants to teach at that time, and a ranking of 1 means that he or she does not want to teach at that time. Determine an assignment of professors to sections that maximizes the total satisfaction of the professors

Preferences	9AM	10AM	11AM	1PM	2PM	3PM
Professor 1	5	5	9	9	8	8
Professor 2	7	4	5	6	4	5
Professor 3	9	8	8	4	4	9

WinstonAlbright_6e_ P05_65.xlsx

Discussion: -

This is like previously solved assignment problems. Each professor ranked their slots and we must assign each section to professor in such a way that we meet our objective which is maximizing the total satisfaction level of the professors. So, our decision variable will be (binary) whether to assign that section to professor or not.

Mathematical Model: -

Parameters (Inputs):

$i \in 1,2,3$ $\quad (i: Index\ for\ professors)$
$j \in 1,2,..6$ $\quad (j: Index\ for\ sections)$
A_{ij} : $Rating\ given\ by\ professor\ i\ to\ section\ j$
M : $Number\ of\ sections\ assigned\ to\ each\ professor\ ; M = 2$

Decision Variables:

x_{ij} : $Whether\ professor\ i\ assigned\ to\ section\ j$

Objective:

$$Maximize\ total\ \ satisfaction\ points = \sum_{j=1}^{6}\sum_{i=1}^{3}(x_{ij} * A_{ij})$$

Constraints:

$$\sum_{j=1}^{6} x_{ij} \le M\ ;\quad for\ i \in \{1,2,3\} \qquad (1)\ Sections\ assigned\ to\ each\ professor$$

$$\sum_{i=1}^{3} x_{ij} \le 1\ ;\quad for\ j \in \{1,2,..6\} \qquad (2)\ Each\ section\ is\ assigned\ to\ atleast\ 1\ professor$$

$$x_{ij} \in \{0,1\} \qquad (3)\ Binary\ Constraint$$

Excel Implementation: Please find the attached spreadsheet for solution.

33[RA].xlsx

Teaching data

Preferences	9AM	10AM	11AM	1PM	2PM	3PM
Professor 1	5	5	9	9	8	8
Professor 2	7	4	5	6	4	5
Professor 3	9	8	8	4	4	9

	9AM	10AM	11AM	1PM	2PM	3PM			
Professor 1	0	0	1	0	1	0	2	<=	2
Professor 2	1	0	0	1	0	0	2	<=	2
Professor 3	0	1	0	0	0	1	2	<=	2
	1	1	1	1	1	1			
	<=	<=	<=	<=	<=	<=			
	1	1	1	1	1	1			

Inputs
Decision variables
Calculated Variables
Constraints
Objective

Total Satisfaction
47