Chapter 2: Data-Driven Decision-Making

# Assignment Problem

## Corresponding reading: Chapter 2, Page 3

### Purpose: Understanding the assignment problem and an efficient algorithm to solve it.

1. Search for “assignment problem” in the internet. Describe what the assignment problem is in your own words.
2. Watch the following video describing the assignment problem and an efficient algorithm to solve it.

<https://www.youtube.com/watch?v=ltgSRxlUoWw&ab_channel=YongWang>

1. Apply the Hungarian algorithm explained in the video to the following assignment problem example.
2. Conduct sensitivity analysis on at least two parameters of the model and investigate its impact on the optimal solution (Hint: increase and decrease two parameters and resolve the model to see if it impacts the optimal assignment. Remember to make *one* change at a time).

A hospital needs to assign four patients to four operating rooms. Depending on the equipment in each operating room, the cost of assigning each patient to each operating room (in $1000) is given in the following table. Use the Hungarian algorithm to find the optimal assignment.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | OR1 | OR2 | OR3 | OR4 |
| Patient 1 | 4 | 6 | 2 | 8 |
| Patient 2 | 3 | 5 | 7 | 3 |
| Patient 3 | 6 | 2 | 5 | 4 |
| Patient 4 | 4 | 7 | 3 | 6 |

***Note:*** *Understanding the case and what you need to do is PART OF THE CASE. If you do not understand a specific part, or are not sure what you should do, you need to review the corresponding reading section in the text before asking for help. You might also need to do some search on the internet. That is all part of the case and your learning process.*