Homework: Submission of Your PowerPoint File

(1) File Format:

First Page of Your Slides

Please include the following information in the first page.

- Topic (e.g., Final Exams, TSP, Load Balancing, ...)
- Your name (in Chinese and English)
- Your student ID number
- Your department (and university if you are exchange students)
- Your research topic (e.g., Deep learning for face recognition)
- Your supervisor's name (e.g., Prof. 程然)

The Other Pages of Your Slides

Content of your homework (no special format)

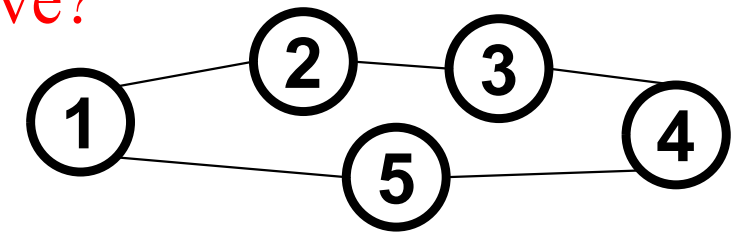
(2) Submission Deadline:

Wednesday afternoon 14:00

(24 hours before the next lecture class)

Homework Assignment

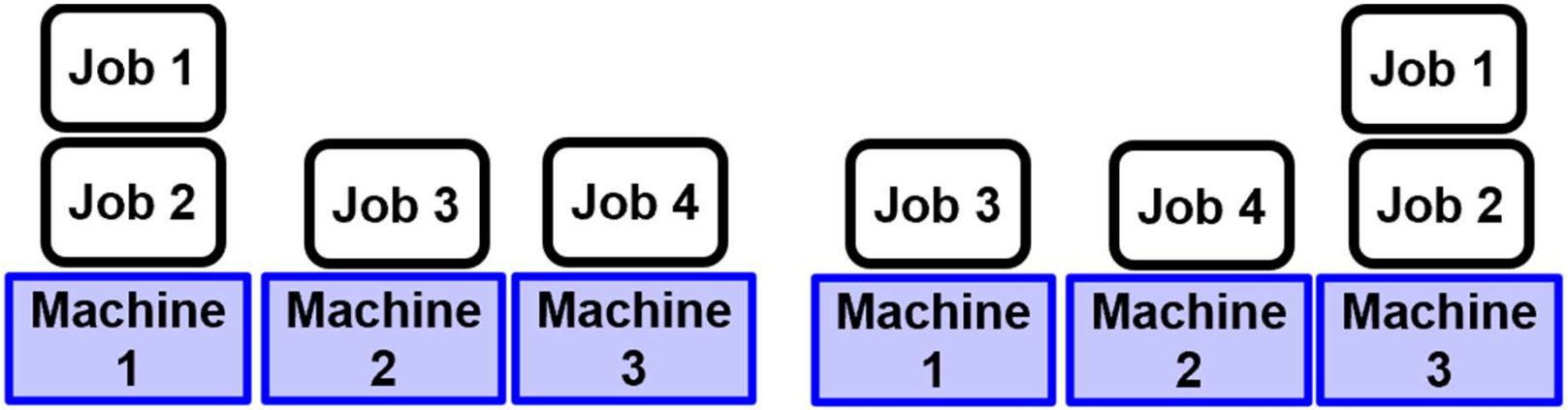
Example 1: An *n*-city TSP problem (i.e., to find the shortest tour to visit all the given *n* cities and return to the start city). The problem size is the total number of different tours. This is not *n*! since many tours can be viewed as the same tour (with respect to the tour length). For example, in the following 5-city TSP problem, the tour 123451 is the same as 154321, 234512, 215432 and some other tours. How many different tours does an *n*-city TSP problem have?



Homework Assignment 1:

Explain that an *n*-city TSP problem has ☐ tours in an understandable manner (e.g., using figures). The point is to clearly explain in an "easy to understand" manner for all students. (Do not use any copy in your presentation slides).

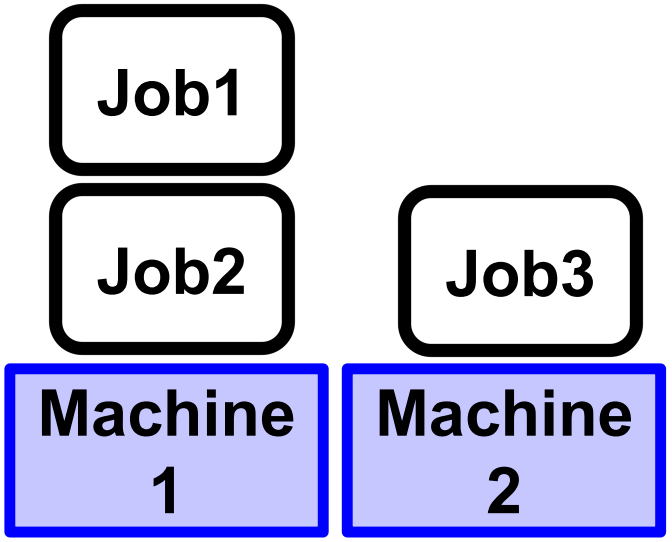
Example 2: A 3-machine 4-job load balancing problem. This problem is to find the best assignment of four jobs to three identical machines. Note that some different assignments are viewed as the same solution since all machines are identical. For example, the assignment of all jobs to Machine 1 is viewed as the same solution as the assignment of all jobs to Machine 2 (or Machine 3). The following two assignments are viewed as the same solution. How many different solutions does the 3-machine 4-job load balancing problem have?

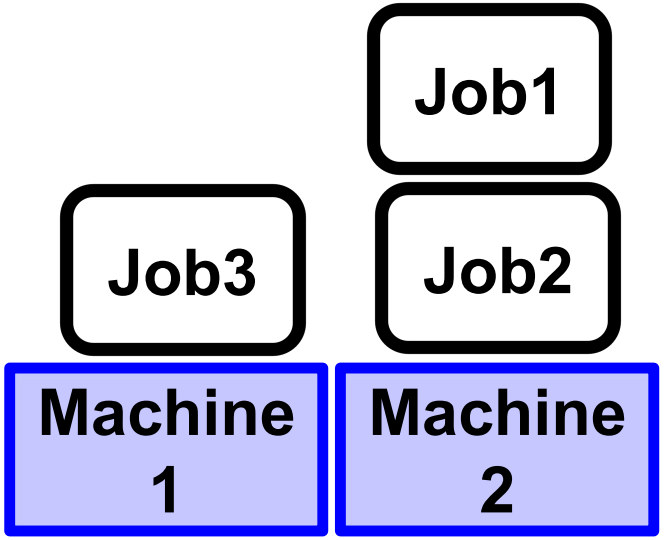


Homework Assignment 2:

Explain that this load balancing problem has ☐ solutions in an understandable manner (e.g., using figures).

Example 3: A 2-machine n-job load balancing problem. As in Example 2, some different assignments (e.g., two assignments below) are viewed as the same solution since the two machines are identical. How many different solutions does the 2-machine n-job load balancing problem have (including an extreme solution where all jobs are assigned to one machine) ?

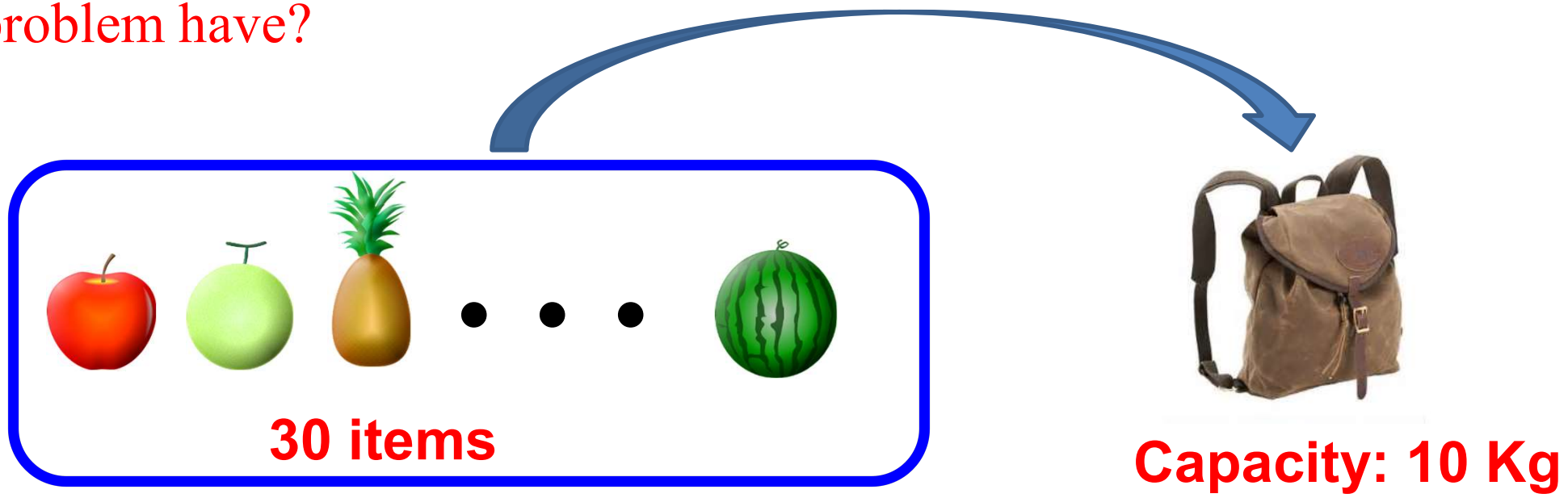




Homework Assignment 3:

Explain that this load balancing problem has ☐ solutions in an understandable manner (e.g., using figures).

Example 4: A 30-item knapsack problem (to find the best item set of the given 30 items under a capacity constraint). The set of all different solutions includes the selection of no items and the selection of all items. How many different solutions does the 30-item knapsack problem have?



Homework Assignment 4:

Explain that this knapsack problem has ☐ solutions in an understandable manner (e.g., using figures).