

CPLEX

Recitation

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How to download?

- <https://ibm.onthehub.com/WebStore/OfferingDetails.aspx?o=9b4eadea-9776-e611-9421-b8ca3a5db7a1>

Assignment Problem

Parameters :

$W = 1, \dots, n$ set of workers waiting to be assigned

$T = 1, \dots, m$ current tasks to be performed

c_{ij} = cost of assigning worker $i \in W$ to task $j \in T$

Decision Variables :

$$X_{ij} = \begin{cases} 1, & \text{if worker } i \text{ assigned to task } j \\ 0, & \text{otherwise} \end{cases}$$

Assignment Problem

Model :

$$\min \sum_{i \in W} \sum_{j \in T} c_{ij} X_{ij} \quad (1)$$

Subject to :

$$\sum_{i \in W} X_{ij} = 1 \quad \forall j \in T \quad (2)$$

$$\sum_{j \in T} X_{ij} = 1 \quad \forall i \in W \quad (3)$$

$$X_{ij} \in \{0, 1\} \quad \forall i \in W, j \in T \quad (4)$$

Assignment Problem

- 4 workers, 4 tasks

	Task 1	Task 2	Task 3	Task 4
Worker 1	14	5	8	7
Worker 2	2	12	6	5
Worker 3	7	8	3	9
Worker 4	2	4	6	10

Cplex Code

```
//Assignment Problem

range Worker=1..4;
range Task=1..4;

int c[Worker][Task]=...;

dvar boolean X[Worker][Task];
dvar float totalCost;

minimize totalCost;

subject to

{
totalCost==sum(i in Worker, j in Task) c[i,j]*X[i,j];

forall (i in Worker) sum (j in Task) X[i,j]==1;
forall (j in Task) sum(i in Worker) X[i,j]==1;

}
```