

Hello,

The example is about allocating trains with maintenance constraints. I marked the problem in yellow.:

Subject to

$$\sum_{u \in U} q_{i,u,k} = 1 \quad \forall k \in K, i \in I^k \cup I_A^k \quad (2)$$

$$x_{j,v,k} = x_{i,v,k-1} \quad \forall k \in K, v \in V, i \in I^{k-1} \cup I_A^{k-1}, j \in I^k \cup I_A^k, (i,j) \in O^k \quad (4)$$

My idea:

Data.dat

```
i = 3; //number of paths i
j = 3; //number of paths j
u = 1; //number of train types
k = 3; //number of timeframes
v = 3; //number of trains
```

OvL.mod

```
int i = ...;
int j = ...;
int u = ...;
int k = ...;
int v = ...;

range PathsWithoutInspection = 1..i; //Set of paths without inspection
range PathsWithInspection = 1..i; //Set of paths with inspection
range Path_J = 1..j; //Set of paths j
range TrainType = 1..u; //Set of train types
range Timeframe = 1..k; //set of time frames
range Train = 1..v; //set of trains

{int} allPaths = PathsWithoutInspection union PathsWithInspection;

dvar float timeDailyInspection[Train][Timeframe];

dvar boolean traintypemoves[Path_I, Traintype, Timeframe];

forall(k in Timeframe, i in allPaths)
constraint2:
sum(u in TrainType)
traintypemoves[i][u][k] == 1;

forall(k in Timeframe, v in Train, i in allPaths, j in allPaths, i and j in O^k)
constraint4:
trainmoves[i][v][k] == trainmoves[i][v][k-1];
```

I am not sure how to code O^k

O^k Set of any two paths (i, j) indicating that path j in time slot k connects with path i in time slot $k - 1$. The pair of paths should be assigned to the same train-sets.