

```

set PLANTAS;
set CENTROS;

param T;

param im0{PLANTAS};
param hm{PLANTAS};
param um{PLANTAS};
param bm{PLANTAS};
param fm{PLANTAS};

param il0{CENTROS};
param ql{CENTROS};
param vl{CENTROS};

param gml;

param pm{PLANTAS, 1..T};
param Bm{PLANTAS, 1..T};
param dl{CENTROS, 1..T};
param cm1{PLANTAS, 1..T};
param cm2{PLANTAS, 1..T};

var X{PLANTAS, 1..T} integer >= 0;
var Y{PLANTAS, 1..T} binary;

var TR{PLANTAS, CENTROS, 1..T} integer >= 0;
var YY{PLANTAS, CENTROS, 1..T} binary;

var I{PLANTAS, 0..T} integer >= 0;
var II{CENTROS, 0..T} integer >= 0;

minimize COSTOS:
    sum{t in 1..T, m in PLANTAS} (fm[m]*Y[m,t] + pm[m,t]*X[m,t]) +
    sum{t in 1..T, m in PLANTAS} (cm1[m,t]*TR[m,1,t] + cm2[m,t]*TR[m,2,t]) +
    sum{t in 1..T, m in PLANTAS} (hm[m]*I[m,t]) +
    sum{t in 1..T, l in CENTROS} (ql[l]*II[l,t]);

subject to CAPACIDAD_MIN {t in 1..T, m in PLANTAS}:
    bm[m]*Y[m,t] <= X[m,t];

subject to CAPACIDAD_MAX {t in 1..T, m in PLANTAS}:
    X[m,t] <= Bm[m,t]*Y[m,t];

subject to INV_IM {t in 1..T, m in PLANTAS}:
    I[m,0] = im0[m];

subject to INV_IL {t in 1..T, l in CENTROS}:
    II[l,0] = il0[l];

subject to INVENTARIO_M {t in 1..T, m in PLANTAS}:
    I[m,t] <= um[m];

subject to INVENTARIO_L {t in 1..T, l in CENTROS}:
    II[l,t] <= vl[l];

subject to BALANCE {t in 1..T, m in PLANTAS}:
    X[m,t] + I[m,t-1] = sum{l in CENTROS}(TR[m,l,t]) + I[m,t];

subject to DEMANDA {l in CENTROS, t in 1..T}:
    sum{m in PLANTAS}(TR[m,l,t]) + II[l,t-1] = dl[l,t] + II[l,t];

subject to LIMITE {t in 1..T, m in PLANTAS, l in CENTROS}:
    TR[m,l,t] <= dl[l,t]*YY[m,l,t] + II[l,t-1];

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set PLANTAS := PLA1 PLA2;  
set CENTROS := CEN1 CEN2;
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param T := 6;
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param : im0 hm um bm fm:=  
PLA1 35 3 40 15 550  
PLA2 20 3 30 20 500;
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param : il0 q1 v1:=  
CEN1 5 1 10  
CEN2 20 1 20;
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param gml := 20;
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```
param pm : 1 2 3 4 5 6:=  
PLA1 25 27 30 31 33 35  
PLA2 30 33 35 36 38 40;
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```
param Bm : 1 2 3 4 5 6:=  
PLA1 60 60 60 55 60 30  
PLA2 100 100 100 85 100 50;
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```
param dl : 1 2 3 4 5 6:=  
CEN1 70 85 75 65 60 70  
CEN2 40 45 50 50 45 40;
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```
param cm1 : 1 2 3 4 5 6:=  
PLA1 4 4 4 4 4 4  
PLA2 2 2 2 3 3 3;
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```
param cm2 : 1 2 3 4 5 6:=  
PLA1 3 3 4 4 4 4  
PLA2 4 4 4 5 5 5;
```