Mathematical Programming: Modelling and Applications

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AMPL model – Carelland

```
set PRODUCTS;

param p {PRODUCTS} >= 0;
param HMan >=0;
param Max {PRODUCTS} >=0;
param m {PRODUCTS} >= 0;
param h {PRODUCTS} >= 0;
param a {PRODUCTS, PRODUCTS} >=0;

var x { PRODUCTS } >= 0;
var y { PRODUCTS } >= 0;

maximize profit:  sum {i in PRODUCTS} (p[i]*y[i] - m[i]*x[i]);

subject to limit{i in PRODUCTS}:  x[i] <= Max[i];

subject to work:  sum {i in PRODUCTS} h[i]*x[i]<= HMan;

subject to balance{i in PRODUCTS} :
y[i] + sum{j in PRODUCTS}(a[j,i]*x[j]) = x[i];
```

AMPL dat – Carelland

```
set PRODUCTS := steel plastics electronics engines;

param HMan:= 830000;

param :                p          m       h          Max      :=
      steel           500        250     0.5     2000000
      plastics       1200        300     2         60000
      electronics     300         50     0.5      650000
      engines        1500        300     1       2000000   ;


param a:         steel     plastics    electronics    engines   :=
steel             0          0.01          0             0.02
plastics          0.2        0             0.05          0.03
electronics       0.01       0.05          0             0.01
engines           0.8        0.11          0.15          0
;
```

Solution – Carelland

```
ILOG AMPL 10.100, licensed to "ecolepolytechnique-palaiseau".
AMPL Version 20060626 (Linux 2.6.9-5.ELsmp)
ILOG CPLEX 10.100, licensed to "ecolepolytechnique-palaiseau",
options: e m b q use=8
CPLEX 10.1.0: optimal solution; objective 435431250
9 dual simplex iterations (6 in phase I)

x [*] :=
electronics   74375
    engines  475833
   plastics   60000
      steel  393958
;

y [*] :=
electronics       0
    engines  465410
   plastics       0
      steel 547.917
;
```