

TD #1

Advanced Mathematical Programming

Leo Liberti, CNRS LIX Ecole Polytechnique
liberti@lix.polytechnique.fr

INF580 — 2017



Section 3
Implementation

The AMPL encoding

- ▶ Three files:
 - ▶ `file.mod`: the *model file*
containing the description of the structured formulation
 - ▶ `file.dat`: the *data file*
containing the description of the instance
 - ▶ `file.run`: the *run file*
the “imperative part”: choice of solver, run, analyze solution...
 - ▶ Run “`ampl < file.run`” and get results on file or screen

The transportation problem in AMPL: .mod

```
# transportation.mod
param Pmax integer;
param Qmax integer;
set P := 1..Pmax;
set Q := 1..Qmax;
param a{P};
param b{Q};
param c{P,Q};
var x{P,Q} >= 0;
minimize cost: sum{i in P, j in Q} c[i,j]*x[i,j];
subject to production{i in P}:
    sum{j in Q} x[i,j] <= a[i];
subject to demand{j in Q}:
    sum{i in P} x[i,j] >= b[j];
```

The transportation problem in AMPL: .dat

```
# transportation.dat
param Pmax := 2;
param Qmax := 1;
param a :=
  1 2.0
  2 2.0
;
param b :=
  1 1.0
;
param c :=
  1 1 1.0
  2 1 2.0
;
```

The transportation problem in AMPL: .run

```
# transportation.run
model transportation.mod;
data transportation.dat;
option solver cplex;
solve;
display x, cost;
```