

Interfacing with Standard LP Solvers

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Unless you decide to work for a company like ILOG there is no need to actually write a linear programming solver. Instead, you simply need to pass the linear program to a standard solver which will then solve it for you. One good option is to express your linear program as a text file in the LP format. The following example LP file is adapted from `/com/cplex/cplex101/examples/data/qpex.lp`.

```
Problem
Sample LP
Maximize
  obj: x1 + 2 x2 + 3 x3
Subject To
  c1: - x1 + x2 + x3 <= 20
  c2: x1 - 3 x2 + x3 = 30
Bounds
  0 <= x1 <= 40
End
```

This format is pretty self-explanatory. One nonobvious feature is that if you don't give the bound for a variable it defaults to nonnegative.

If you have a lot of LPs to solve creating and deleting files is tedious and slow. A better way is to use the C++ interface to CPLEX. This interface allows you to create variables, combine them using `+`, `-`, `j=` etc. to form objectives and constraints, and then add them to the model. See examples such as `/com/cplex/cplex101/examples/src/ilodiet.cpp`. There are also CPLEX interfaces for C and Java.