

Anatomy of a Concrete Pyomo Model

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import pyomo.environ as pyo

A = ['hammer', 'wrench', 'screwdriver', 'towel']
b = {'hammer':8, 'wrench':3, 'screwdriver':6, 'towel':11}
w = {'hammer':5, 'wrench':7, 'screwdriver':4, 'towel':3}

W_max = 14

model = pyo.ConcreteModel()
model.x = pyo.Var( A, within=pyo.Binary )

model.value = pyo.Objective(
    expr = sum( b[i]*model.x[i] for i in A ),
    sense = pyo.maximize )

model.weight = pyo.Constraint(
    expr = sum( w[i]*model.x[i] for i in A ) <= W_max )

opt = pyo.SolverFactory('glpk')
result_obj = opt.solve(model, tee=True)

model.pprint()
  
```

Import packages

Specify/
Import Data

Can be imported or even applied to model later

Define Problem

Solve Problem

Report Results

Item (A)	Weight (w)	Benefit (b)
hammer	5	8
wrench	7	3
screwdriver	4	6
towel	3	11

$$\begin{aligned}
 & \max_x \quad \sum_{i \in A} b_i x_i \\
 \text{s.t.} \quad & \sum_{i \in A} w_i x_i \leq W_{\max} \\
 & x_i \in \{0,1\} \quad \forall i \in A
 \end{aligned}$$