Unit Commitment Optimization model

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Sets

T set of total time from [0,maxTime]- maxTime furthest out to optimize for
P set of plants which we are optimizing for dispatching
R set of time period for when starting up and ramping is possible
(will assume 2-MaxTime inclusive)

Parameters

o_p variable operating cost of plant p
c_p capital (fixed) cost of plant p
e_p environmental cost associated with plant generating electricity at plant p
t_p startup cost (turn on) of plant p
r_p ramp rate percentage of plant p
g_p maximum generating capacity of plant p
m_p minimum generating capacity of plant p
d_t demand at time t for the system

Decision Variables

$x_{p,t}$ generation for plant p at time t
$i_{p,t}$ operation for plant p at time t (1 is operating, 0 is not operating)
$s_{p,r}$ plant p switches on at ramp time r (1 switching on, 0 otherwise)