BEE 4750/5750 Homework 3

Jason Shao (jls647)

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Problem 1

Problem 1.1

The decision variables are the installed capacities of each generator type g, as well as the production from generator type g in period t

Notation:

$$x_g = \text{installed capapcity of generator type g}$$
$$x_1 - Geothermal, x_2 - Coal, x_3 - CCGT, x_4 - CT, x_5 - Wind, x_6 - Solar$$
$$\vec{x} \text{ is a vector of length 6 containing all of the x values}$$

$$t = 1:24$$
$$g = 1:6$$
$$y_{g,t} = \text{production of generator type g at time period t}$$

Y is a 6 x 24 matrix containing the production of each generator type g at each time period t, $y_{g,t}$

Problem 1.2

$$\text{MinCost} = \text{Investment Cost} + \text{Operating Cost} + \text{Non-served demand penalty}$$

```
investment_cost = [457000, 268000, 85000, 62580, 92000, 92000];
op_cost = [0, 22, 35, 45, 0, 0];
#note there are only operating costs for coal, CCGT, and CT
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$$\text{MinCost} = investment\_cost * \vec{x} + 20 * \sum_{t=1}^{24} y_{2,t} + 35 * \sum_{t=1}^{24} y_{3,t} + +45 * \sum_{t=1}^{24} y_{4,t} +$$