

Tutorial 9: More Nonlinear Programming

GIAN Short Course on Optimization: Applications, Algorithms, and Computation

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Modify `TaxBeer.mod` ... under which scenario is beer not taxed?

Write AMPL models for the following (simple) MPECs:

$$(P_1) \quad \underset{x,y}{\text{minimize}} (x-1)^2 + (y-1)^2 \quad \text{subject to} \quad 0 \leq x \perp y \geq 0$$

$$(P_2) \quad \underset{x,y}{\text{minimize}} (x-1)^2 + y^3 + y^2 \quad \text{subject to} \quad 0 \leq y \perp x \geq 0$$

$$(P_3) \quad \underset{x,y}{\text{minimize}} f_i(x,y) \quad \text{subject to} \quad 0 \leq y \perp y-x \geq 0$$

with $f_1(x,y) = (x-1)^2 + y^2$ and $f_2(x,y) = x^2 + (y-1)^2$

- Formulate each model using complements and use `knitro`
- Formulate the model as an NLP
- Try the penalization approach, looping over the penalty

