# A MINLP with Trigonometric Functions

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## 1 Goal

The goal of this document is to formally state the optimization problem which is solved in the example named as *Inverse_Optimization_Related_Problem*.

## 2 Problem Formulation

For a given value $\theta > 0$ and $u \in \mathbb{R}^n$, the following optimization problem is solved:

$$\begin{cases} \min\limits_{x,y} & \sum\limits_{i=1}^{n} (\theta + u_i)(\sin(x_i)\cos(x_i)x_i^2) + \sum\limits_{i=1}^{n} \cos(y_j^2)\sin(y_j) \\ \text{s.t.} & x_i x_1 \leq 1, \quad \forall i \\ & \sum\limits_{i=1}^{n} x_i^2 \leq 10 \\ & \sum\limits_{i=1}^{n} x_i^3 \leq \sum\limits_{i=1}^{n} \sin(x_i)\cos(x_i) \\ & \sum\limits_{i,j=1}^{n} x_i y_j \leq 1 \\ & x_i \in \mathbb{R}, \quad \forall i \\ & y_i \in \{0,1\}, \quad \forall i \end{cases} \tag{1}$$