

# Linear Programming Calculator

Linear Programming Calculator is a product that helps you solve LPPs using the simplex method for constraints that are greater than or equal to, the Big M method for constraints that are less than or equal to or equal to, and finding integer solutions using Gomory cuts.

## Quick Start 🏃:

When you start the project, it displays a **Startup window** where you can set the number of variables and constraints.

 Startup Window

Then, when you press *Generate Problem*, another window will appear where you can set up all the necessary parameters. You can also **return to the startup window**, press *New Problem*, to edit the number of variables or constraints.

 Problem Setup Window

Finally, when you press *Solve* button, the application navigates to the **Result window**, where you can view all steps of the problem-solving process. Additionally, you can edit the current problem by pressing *Edit problem*, or start a new one by pressing *New problem*.

 Result Window

# Linear Programming Solvers.

This class library contains three LPP solvers:

- **Primary Simplex Method;**
- **The Big M method;**
- **Gomory Cutting-Plane method.**

It also contains essential objects for defining a problem:

- **Linear Programming Problem;**
- **Constraint.**

## Usage example :

```
var problem = new LinearProgrammingProblem
{
    IsMaximization = true,
    ObjectiveFunctionCoefficients = new List<string> { "1", "1" },
    Constraints = new List<Constraint>
    {
        new Constraint
        {
            Coefficients = new List<string> { "6", "5" },
            RightHandSide = "20",
            Type = ConstraintType.LessThanOrEqualTo,
        },
        new Constraint
        {
            Coefficients = new List<string> { "2", "3" },
            RightHandSide = "10",
            Type = ConstraintType.LessThanOrEqualTo,
        },
    }
};

var solver = new SimplexSolver(problem);
solver.Solve();
var gomory = new GomorySolver(_solver.Table, problem);
gomory.Solve();
```