

## Report 1

### Team information.

- Team leader: Andrei Pavlov - 5/5 points
- Team member 1: Latypov Bulat - 5/5 points
- Team member 2: Galiev Irek - 0/5 points
- Team member 3: Sitdikov Kamil - 0/5 points

### Link to the product.

- The product is available: <https://github.com/Bulatypov/optimization-homework>

### Programming language.

- Programming language: C++

### Linear programming problem.

The problem is about finding trading possibilities curve with the given production possibilities curve (PPC) and prices on the world market. The legend: imagine we have a country with  $n$  regions. Each one can make  $m$  products and has function:  $c_1A_1 + \dots + c_mA_m = C$ , where everything  $\geq 0$ ,  $c_i$  is the price for  $i$ 'th product on the market,  $A_j$  is the amount of  $j$ 'th product all the country can sell to world market,  $C$  is the total money we got for selling (profit). We would like to maximize  $C$  with the given parameters  $c_1, c_2, \dots$  and given the total PPC of the country.

You can read about this problem here: [production-possibility frontier](#)

- Maximization or Minimization? - Maximization
- Objective function:  $c_1A_1 + \dots + c_mA_m$
- Constraint functions: planes that in sum give us PPC.

### Input

The input contains:

- A vector of coefficients of objective function -  $C$ .
- A matrix of coefficients of constraint function -  $A$ .
- A vector of right-hand side numbers -  $b$ .

### Output/Results

The output contains:

- A vector of decision variables -  $X^*$ .
- Maximum value of the objective function.

### Code

Link to github provided at the top of the report