

Seminar 1.

Task 1. In Microland there are n people, each has a utility function, $u(x_1, x_2) = x_1^{\alpha_1} x_2^{\alpha_2}$, where x_1, x_2 - the number of goods, $\alpha_1 + \alpha_2 = 1$, $\alpha_1 \geq 0, \alpha_2 \geq 0$. All individuals have incomes in the amount b . Create a program that for a given n , commodity prices simulates the total consumption of goods in the country depending on income level b .

Task 2. In Microland live n people, each a utility function $u(x_1, x_2) = x_1^{\alpha_1} x_2^{\alpha_2}$, where x_1, x_2 - the number of goods, and for each inhabitant - a random evenly distributed value in the interval $[0,3; 0.7]$, $\alpha_2 = 1 - \alpha_1$, $\alpha_1 \geq 0, \alpha_2 \geq 0$. In each period:

- all individuals receive incomes that are randomly normally distributed with parameters (1000; 160);
- individuals decide to buy goods, spending all available income;
- $K\%$ of individuals who cannot meet the minimum need for goods die of hunger;
- population growth in the presence of hunger is $\beta_1\%$, under other conditions - $\beta_2\%$;
- producers of goods set prices for products following the functions of supply:
 $P_1 = 12 + 0,2Q_1$, where Q_1 - the total supply of good x_1 , P_1 - its price;
 $P_2 = 5 + 0,7Q_2$, where Q_2 - the total supply of goods, P_2 - its price.

Create a program that simulates the total consumption of goods in the country in the first M periods.