Задание №2.

Листинг программы:

import numpy as np  
import scipy.optimize as opt  
  
profits = np.array([33, 38, 43, 28])  
volumes = np.array([15, 24, 33, 8])  
weights = np.array([4, 8, 7, 5])  
min\_quantities = np.array([120, 70, 50, 100])  
max\_quantities = np.array([210, 170, 180, 230])  
  
volume\_constraint = {'type': 'ineq', 'fun': lambda x: 10000 - np.dot(x, volumes)}  
weight\_constraint = {'type': 'ineq', 'fun': lambda x: 3000 - np.dot(x, weights)}  
  
min\_constraints = [{'type': 'ineq', 'fun': lambda x: x - min\_quantities} for min\_quantities in min\_quantities]  
max\_constraints = [{'type': 'ineq', 'fun': lambda x: max\_quantities - x} for max\_quantities in max\_quantities]  
  
def objective(x):  
 return np.dot(x, profits)  
  
result = opt.minimize(objective, np.ones(len(profits)), constraints=min\_constraints + max\_constraints + [volume\_constraint, weight\_constraint], method='SLSQP')  
  
print("Оптимальный план загрузки:")  
for i, quantity in enumerate(result.x):  
 print(f"Товар {i + 1}: {int(quantity)} единиц")  
print(f"Общая прибыль: {result.fun:.2f}")

Скрин работы:

