**ЛАБОРАТОРНАЯ РАБОТА №9**

Понятие об игровых моделях.

Автор работы

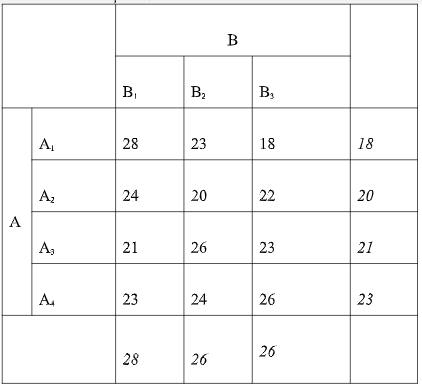
студент 2 курса

группы ИВТ(1) подгруппы 2

Ефимова В.С.

**Постановка задачи:**

Магазин может завезти в различных пропорциях товары трех типов (А1, А2, А3); их реализация и прибыль магазина зависят от вида товара и состояния спроса. Предполагается, что спрос может иметь три состояния (В1, В2, В3) и не прогнозируется. Определить оптимальные пропорции в закупке товаров из условия максимизации средней гарантированной прибыли при следующей матрице прибыли (табл.3.7).



**Решение задачи:**

28x1 + 23x2 + 18x3 =< 1  
24x1 + 20x2 + 22x3 =< 1  
21x1 + 26x2 + 23x3 =< 1  
23x1 + 24x2 + 26x3 =< 1

F(x) = x1 + x2 + x3 -> max

28x1 + 23x2 + 18x3 + x4 =< 1  
24x1 + 20x2 + 22x3 + x5 =< 1  
21x1 + 26x2 + 23x3 + x6 =< 1  
23x1 + 24x2 + 26x3 + x7 =< 1

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Базис | x1 | x2 | x3 | x4 | x5 | x6 | x7 | B |
| x4 | 28 | 23 | **18** | 1 | 0 | 0 | 0 | 1 |
| x5 | 24 | 20 | **22** | 0 | 1 | 0 | 0 | 1 |
| x6 | 21 | 26 | **23** | 0 | 0 | 1 | 0 | 1 |
| x7 | **23** | **24** | **26** | **0** | **0** | **0** | **1** | **1** |
| F | -1 | -1 | **-1** | 0 | 0 | 0 | 0 | 0 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Базис | x1 | x2 | x3 | x4 | x5 | x6 | x7 | B |
| x4 | **157/13** | **84/13** | **0** | **1** | **0** | **0** | **-9/13** | **4/13** |
| x5 | **53/13** | -4/13 | 0 | 0 | 1 | 0 | -11/13 | 2/13 |
| x6 | **11/26** | 62/13 | 0 | 0 | 0 | 1 | -23/26 | 3/26 |
| x7 | **23/26** | 12/13 | 1 | 0 | 0 | 0 | 1/26 | 1/26 |
| F | **-3/26** | -1/13 | 0 | 0 | 0 | 0 | 1/12 | 1/26 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Базис | x1 | x2 | x3 | x4 | x5 | x6 | x7 | B |
| x4 | 1 | **83/157** | 0 | 13/157 | 0 | 0 | -9/157 | 4/157 |
| x5 | 0 | **-425/157** | 0 | -53/157 | 1 | 0 | -82/147 | 6/157 |
| x6 | **0** | **1389/314** | **0** | **-18/314** | **0** | **1** | **-133/157** | **31/314** |
| x7 | 0 | **143/314** | 1 | -23/314 | 0 | 0 | 14/157 | 5/314 |
| F | 0 | **-5/314** | 0 | 3/314 | 0 | 0 | 5/157 | 13/314 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Базис | x1 | x2 | x3 | x4 | x5 | x6 | x7 | B |
| x4 | 1 | 0 | 0 | 124/1389 | 0 | -166/1389 | 61/1389 | 10/1389 |
| x5 | 0 | 0 | 0 | -588/1389 | 1 | 850/1389 | -1534/1389 | 137/1389 |
| x6 | 0 | 1 | 0 | -17/1389 | 0 | 314/1389 | -266/1389 | 31/1389 |
| x7 | 0 | 0 | 1 | -34/1389 | 0 | -193/1389 | 245/1389 | 8/1389 |
| F | 0 | 0 | 0 | 18/1289 | 0 | 5/1389 | 40/1389 | 58/1389 |

x1 = 19/1389  
x2 = 31/1389  
x3 = 8/1389

F(x) = 58/1389

g = 1/F(x) = 1389/58

y1 = 13/1389  
y2 = 0  
y3 = 5/1389  
y4 = 40/1389

Z(y) = 58/1389

qi = g\*yi  
q1 = 1389/58 \* 13/1389 = 13/58  
q2 = 1389/58 \* 0 = 0  
q3 = 1389/58 \* 5/1389 = 5/58  
q4 = 1389/58 \* 40/1389 = 40/58 = 20/29

pi = g\*xi  
p1 = 1389/58 \* 19/1389 = 19/58  
p2 = 1389/58 \* 31/1389 = 31/58  
p3 = 1389/58 \* 8/1389 = 8/58 = 4/29

Ответ: (13/58; 0; 5/58; 20/29)