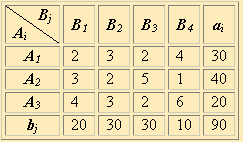
**Лабораторная работа №4**

**Транспортная задача. Методы нахождения начального решения транспортной задачи**

# **РЕШИТЬ ЗАДАЧУ:**



**Метод северо-западного угла**

| **Bj**  **Ai** | **B1** | | **B2** | | **B3** | | **B4** | | **ai** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **A1** |  | 2 |  | 3 |  | 2 |  | 4 | 30 |
| **20** | | **10** | | **−** | | **−** | |
| **A2** |  | 3 |  | 2 |  | 5 |  | 1 | 40 |
| **−** | | **20** | | **20** | | **−** | |
| **A3** |  | 4 |  | 3 |  | 2 |  | 6 | 20 |
| **−** | | **−** | | **10** | | **10** | |
| **bj** | 20 | | 30 | | 30 | | 10 | | 90 |

𝑍1 = 20 ∗ 2 + 10 ∗ 3 + 20 ∗ 2 + 20 ∗ 5 + 10 ∗ 2 + 10 ∗ 6 = 290

# **Метод минимальной стоимости**

| **Bj**  **Ai** | **B1** | | **B2** | | **B3** | | **B4** | | **ai** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **A1** |  | 2 |  | 3 |  | 2 |  | 4 | 30 |
| **20** | |  | | **10** | |  | |
| **A2** |  | 3 |  | 2 |  | 5 |  | 1 | 40 |
|  | | **30** | |  | | **10** | |
| **A3** |  | 4 |  | 3 |  | 2 |  | 6 | 20 |
|  | |  | | **20** | |  | |
| **bj** | 20 | | 30 | | 30 | | 10 | | 90 |

𝑍2 = 20 ∗ 2 + 10 ∗ 2 + 30 ∗ 2 + 10 ∗ 1 + 20 ∗ 2 = 170

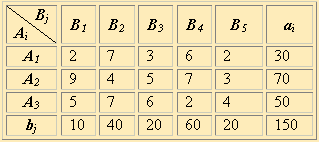
# **Метод аппроксимации Фогеля**

| **Bj**  **Ai** | **B1** | | **B2** | | **B3** | | **B4** | | **ai** | ∆𝐜**ij** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **A1** |  | 2 |  | 3 |  | 2 |  | 4 | 30 | 1, 1, 1, В |
| **20** | |  | | **10** | |  | |
| **A2** |  | 3 |  | 2 |  | 5 |  | 1 | 40 | 1, 1, 1, В |
|  | | **30** | |  | | **10** | |
| **A3** |  | 4 |  | 3 |  | 2 |  | 6 | 20 | 1, 1, В |
|  | |  | | **20** | |  | |
| **bj** | 20 | | 30 | | 30 | | 10 | | 90 |  |
| ∆𝐜**ij** | 1, 1, В | | 1, 1, В | | 3, 3, В | | 3, В | |  |  |

𝑍3 = 20 ∗ 2 + 30 ∗ 2 + 10 ∗ 2 + 20 ∗ 2 + 10 ∗ 1 = 160

𝑍3 < 𝑍2 < 𝑍1, следовательно, самый выгодный план перевозок был получен методом аппроксимации Фогеля

# **РЕШИТЬ ЗАДАЧУ:**



**Метод северо-западного угла**

| **Bj**  **Ai** | **B1** | | **B2** | | **B3** | | **B4** | | **B5** | | **ai** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **A1** |  | 2 |  | 7 |  | 3 |  | 6 |  | 2 | 30 |
| **10** | | **20** | | **−** | | **−** | | **−** | |
| **A2** |  | 9 |  | 4 |  | 5 |  | 7 |  | 3 | 70 |
| **−** | | **20** | | **20** | | **30** | | **−** | |
| **A3** |  | 5 |  | 7 |  | 6 |  | 2 |  | 4 | 50 |
| **−** | | **−** | | **−** | | **30** | | **20** | |
| **bj** | 10 | | 40 | | 20 | | 60 | | 20 | | 150 |

𝑍1 = 10 ∗ 2 + 20 ∗ 7 + 20 ∗ 4 + 20 ∗ 5 + 30 ∗ 7 + 30 ∗ 2 + 20 ∗ 4 = 6

| **Bj**  **Ai** | **B1** | | **B2** | | **B3** | | **B4** | | **B5** | | **ai** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **A1** |  | 2 |  | 7 |  | 3 |  | 6 |  | 2 | 30 |
| **10** | |  | |  | |  | | **20** | |
| **A2** |  | 9 |  | 4 |  | 5 |  | 7 |  | 3 | 70 |
|  | | **40** | | **20** | | **10** | |  | |
| **A3** |  | 5 |  | 7 |  | 6 |  | 2 |  | 4 | 50 |
|  | |  | |  | | **50** | |  | |
| **bj** | 10 | | 40 | | 20 | | 60 | | 20 | | 150 |

# **Метод минимальной стоимости**

𝑍2 = 10 ∗ 2 + 40 ∗ 4 + 20 ∗ 5 + 10 ∗ 7 + 50 ∗ 2 + 20 ∗ 2 = 49

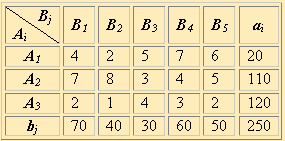
| **Bj**  **Ai** | **B1** | | **B2** | | **B3** | | **B4** | | **B5** | | **ai** | ∆𝐜**ij** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **A1** |  | 2 |  | 7 |  | 3 |  | 6 |  | 2 | 30 | 0, 1, 1, В |
| **10** | |  | | **20** | |  | |  | |
| **A2** |  | 9 |  | 4 |  | 5 |  | 7 |  | 3 | 70 | 1, 1, 2, В |
|  | | **40** | |  | | **10** | | **20** | |
| **A3** |  | 5 |  | 7 |  | 6 |  | 2 |  | 4 | 50 | 2, В |
|  | |  | |  | | **50** | |  | |
| **bj** | 10 | | 40 | | 20 | | 60 | | 20 | | 150 |  |
| ∆𝐜**ij** | 3, 7, В | | 3, 3, В | | 2, 2, В | | 4, 1, В | | 1, 1, В | |  |  |

# **Метод аппроксимации Фогеля**

𝑍3 = 10 ∗ 2 + 40 ∗ 4 + 20 ∗ 3 + 50 ∗ 2 + 10 ∗ 7 + 20 ∗ 3 = 470

𝑍3 < 𝑍2 < 𝑍1, следовательно, самый выгодный план перевозок был получен методом аппроксимации Фогеля

# **РЕШИТЬ ЗАДАЧУ:**



# **Метод северо-западного угла**

| **Bj**  **Ai** | **B1** | | **B2** | | **B3** | | **B4** | | **B5** | | **ai** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **A1** |  | 4 |  | 2 |  | 5 |  | 7 |  | 6 | 20 |
| **20** | | **−** | | **−** | | **−** | | **−** | |
| **A2** |  | 7 |  | 8 |  | 3 |  | 4 |  | 5 | 110 |
| **50** | | **40** | | **20** | | **−** | | **−** | |
| **A3** |  | 2 |  | 1 |  | 4 |  | 3 |  | 2 | 120 |
| **−** | | **−** | | **10** | | **60** | | **50** | |
| **bj** | 70 | | 40 | | 30 | | 60 | | 50 | | 250 |

𝑍1 = 20 ∗ 4 + 50 ∗ 7 + 40 ∗ 8 + 20 ∗ 3 + 10 ∗ 4 + 60 ∗ 3 + 50 ∗ 2 = 1130

# **Метод минимальной стоимости**

| **Bj**  **Ai** | **B1** | | **B2** | | **B3** | | **B4** | | **B5** | | **ai** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **A1** |  | 4 |  | 2 |  | 5 |  | 7 |  | 6 | 20 |
|  | |  | |  | |  | | **20** | |
| **A2** |  | 7 |  | 8 |  | 3 |  | 4 |  | 5 | 110 |
|  | |  | | **30** | | **60** | | **20** | |
| **A3** |  | 2 |  | 1 |  | 4 |  | 3 |  | 2 | 120 |
| **70** | | **40** | |  | |  | | **10** | |
| **bj** | 70 | | 40 | | 30 | | 60 | | 50 | | 250 |

𝑍2 = 70 ∗ 2 + 40 ∗ 1 + 30 ∗ 3 + 60 ∗ 4 + 20 ∗ 6 + 20 ∗ 5 + 10 ∗ 2 = 750

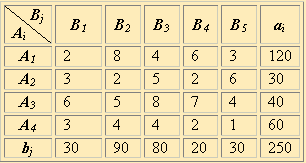
# **Метод аппроксимации Фогеля**

| **Bj**  **Ai** | **B1** | | **B2** | | **B3** | | **B4** | | **B5** | | **ai** | ∆𝐜**ij** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **A1** |  | 4 |  | 2 |  | 5 |  | 7 |  | 6 | 20 | 2, 2, В |
| **−** | | **20** | | **−** | | **−** | | **−** | |
| **A2** |  | 7 |  | 8 |  | 3 |  | 4 |  | 5 | 110 | 1, 1, 1, В |
| **20** | | **−** | | **30** | | **60** | | **−** | |
| **A3** |  | 2 |  | 1 |  | 4 |  | 3 |  | 2 | 120 | 1, 1, 1, В |
| **50** | | **20** | | **−** | | **−** | | **50** | |
| **bj** | 70 | | 40 | | 30 | | 60 | | 50 | | 250 |  |
| ∆𝐜**ij** | 2, 5, В | | 1, 7, В | | 1, 1, В | | 1, 1, В | | 3, В | |  |  |

𝑍3 = 20 ∗ 7 + 50 ∗ 2 + 20 ∗ 2 + 20 ∗ 1 + 30 ∗ 3 + 60 ∗ 4 + 50 ∗ 2 = 730

𝑍3 < 𝑍2 < 𝑍1, следовательно, самый выгодный план перевозок был получен методом аппроксимации Фогеля

# **РЕШИТЬ ЗАДАЧУ:**



# **Метод северо-западного угла**

| **Bj**  **Ai** | **B1** | | **B2** | | **B3** | | **B4** | | **B5** | | **ai** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **A1** |  | 2 |  | 8 |  | 4 |  | 6 |  | 3 | 120 |
| **30** | | **90** | | **−** | | **−** | | **−** | |
| **A2** |  | 3 |  | 2 |  | 5 |  | 2 |  | 6 | 30 |
| **−** | | **−** | | **30** | | **−** | | **−** | |
| **A3** |  | 6 |  | 5 |  | 8 |  | 7 |  | 4 | 40 |
| **−** | | **−** | | **40** | | **−** | | **−** | |
| **A4** |  | 3 |  | 4 |  | 4 |  | 2 |  | 1 | 60 |
| **−** | | **−** | | **10** | | **20** | | **30** | |
| **bj** | 30 | | 90 | | 80 | | 20 | | 30 | | 250 |

𝑍1 = 30 ∗ 2 + 90 ∗ 8 + 30 ∗ 5 + 40 ∗ 8 + 10 ∗ 4 + 20 ∗ 2 + 30 ∗ 1 = 1360

# **Метод минимальной стоимости**

| **Bj**  **Ai** | **B1** | | **B2** | | **B3** | | **B4** | | **B5** | | **ai** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **A1** |  | 2 |  | 8 |  | 4 |  | 6 |  | 3 | 120 |
| **30** | | **10** | | **80** | | **−** | | **−** | |
| **A2** |  | 3 |  | 2 |  | 5 |  | 2 |  | 6 | 30 |
| **−** | | **30** | | **−** | | **−** | | **−** | |
| **A3** |  | 6 |  | 5 |  | 8 |  | 7 |  | 4 | 40 |
| **−** | | **40** | | **−** | | **−** | | **−** | |
| **A4** |  | 3 |  | 4 |  | 4 |  | 2 |  | 1 | 60 |
| **−** | | **10** | | **−** | | **20** | | **30** | |
| **bj** | 30 | | 90 | | 80 | | 20 | | 30 | | 250 |

𝑍2 = 30 ∗ 2 + 10 ∗ 8 + 30 ∗ 2 + 40 ∗ 5 + 10 ∗ 4 + 80 ∗ 4 + 20 ∗ 2 + 30 ∗ 1 = 830

# **Метод аппроксимации Фогеля**

| **Bj**  **Ai** | **B1** | | **B2** | | **B3** | | **B4** | | **B5** | | **ai** | ∆𝐜**ij** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **A1** |  | 2 |  | 8 |  | 4 |  | 6 |  | 3 | 120 | 1, 2, 2,  4, В |
| **30** | | **10** | | **80** | | **−** | | **−** | |
| **A2** |  | 3 |  | 2 |  | 5 |  | 2 |  | 6 | 30 | 0, 0, В |
| **−** | | **30** | | **−** | | **−** | | **−** | |
| **A3** |  | 6 |  | 5 |  | 8 |  | 7 |  | 4 | 40 | 1, 1, 1,  3, В |
| **−** | | **40** | | **−** | | **−** | | **−** | |
| **A4** |  | 3 |  | 4 |  | 4 |  | 2 |  | 1 | 60 | 1, 1, 1,  0, В |
| **−** | | **10** | | **−** | | **20** | | **30** | |
| **bj** | 30 | | 90 | | 80 | | 20 | | 30 | | 250 |  |
| ∆𝐜**ij** | 1, 1, В | | 2, 1 , В | | 0, 0, В | | 0, 4, В | | 2, В | |  |  |

𝑍3 = 30 ∗ 2 + 10 ∗ 8 + 30 ∗ 2 + 40 ∗ 5 + 10 ∗ 4 + 80 ∗ 4 + 20 ∗ 2 + 30 ∗ 1 = 830

𝑍3 = 𝑍2, 𝑍2 < 𝑍1, 𝑍3 < 𝑍1, следовательно, самый выгодный план перевозок был получен методом минимальной стоимости и методом аппроксимации Фогеля