

An Economic Interpretation of Duality

Зачетное задание для студентов РАФ и РГФ

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Методы оптимальных решений

Самостоятельная работа

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Зачетное задание—Quiz Assignment

- 1 Problem Statement**
 - Direct Problem
 - Dual Problem
 - Assignment for your individual quiz work
- 2 Paper Organization**
 - Structuring your paper
- 3 Вопросы & Ответы**
 - Q & A

The Direct Problem Statement

The Almine Coal Company has four mines. Each mine produces three types of coal, as shown in the following table.

①

Mine	Daily cost production (in hundreds of tones)			Cost of operation (in thousands of dollars)
	Type of coal			
	A	B	C	
I	4	5	3	4
II	2	1	0	2
III	3	2	5	3
IV	4	2	6	3
Orders	20	30	40	

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Its problem is to fill its orders at minimum cost.

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The Dual Problem Statement

Another company shows its interest and makes an offer

The managers of a private company, Krays & Sons, have access to this information and feel they can mine coal more cheaply.

- 1 However, they do not have the distribution capability of Almine.
- 2 They offer to operate Almine's facilities and then sell the coal, already sorted by type, to Almine.

- Krays & Sons' problem is to find an offer, attractive to Almine, which produces the greatest profit for them.

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Assignment for your individual quiz work

Solve separately the both problems

For each problem, first define

- 1 What are the unknowns?
- 2 What are the cost/profit formula?
- 3 What is the objective?
- 4 What are the constraints?

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Then do the following assignments:

- 1 Solve the both, direct and dual, problems manually using Simplex Method.

Solve separately the both problems

For each problem, first define

- 1 What are the unknowns?
- 2 What are the cost/profit formula?
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Then do the following assignments:

- 1 *(to view, go backwards)*
- 2 Solve the both, direct and dual, problems automatically using the SimplexWin program.

Solve separately the both problems

For each problem, first define

- 1 What are the unknowns?
- 2 What are the cost/profit formula?
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- 4 What are the constraints?

Then do the following assignments:

- 1 *(to view, go backwards)*
- 2 *(to view, go backwards)*
- 3 Give your written explanations to your solutions.

Organize your written work as follows

Begin your text with the standard title sheet.

Contents

- 1 Introduction [*Briefly, what your paper is about*]
- 2 Duality in Linear Programming [*optional*]
- 3 Direct Problem Solution [*optional*]
- 4 Conclusions [*optional*]
- 5 References [*optional*]

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