

AN OPTIMIZATION PROBLEM



IE-202

COURSE PROJECT PHASE 2

Dry & Happy

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Summary

In this short summary report for our class project assignment, we are going to demonstrate our findings using the FICO Xpress software. For our assigned project Dry & Happy, we were given the dataset number **8**.

Our *constraints* are in lines **32-53**. The first constraint is used to satisfy the demand from each shop (Shops can satisfy their demand from either supplying from the warehouses, or directly from the facility). The second constraint is used to make sure that the number of products sent from warehouse i does not exceed the total inventory. The third constraint is used to obtain a proper binary variable on if warehouse i serves shop j or not. The fourth constraint denotes that each shop may only be supplied by one warehouse, and our last constraint denotes that each warehouse may only serve at most p shops. On the other hand, our objective to minimize the cost of the firm is in line **56** in our code.

Throughout the code i is used to denote warehouse i , and j is used to denote shop j . The parameters given in the question, which are costs, inventory, demand, fixed cost, and the maximum amount, could be seen in lines **8-15**. Our decision variables are given in lines **18-20**, where Z denotes the number of products sent to shop j directly from the facility, Y is a binary variable showing whether warehouse i serves shop j , and X denotes the number of products sent from warehouse i to shop j .

We have found our *objective function*'s value to be **1714**.

And we have found the values of our decision variables as the following:

$X_{11} = \mathbf{275}$		
$X_{21} = \mathbf{0}$	$X_{25} = \mathbf{381}$	$Y_{24} = \mathbf{1}$
$X_{12} = \mathbf{351}$	$Y_{11} = \mathbf{1}$	$Y_{15} = \mathbf{0}$
$X_{22} = \mathbf{0}$	$Y_{21} = \mathbf{0}$	$Y_{25} = \mathbf{1}$
$X_{13} = \mathbf{43}$	$Y_{12} = \mathbf{1}$	$Z_1 = \mathbf{0}$
$X_{23} = \mathbf{0}$	$Y_{22} = \mathbf{0}$	$Z_2 = \mathbf{0}$
$X_{14} = \mathbf{0}$	$Y_{13} = \mathbf{1}$	$Z_3 = \mathbf{356}$
$X_{24} = \mathbf{180}$	$Y_{23} = \mathbf{0}$	$Z_4 = \mathbf{15}$
$X_{15} = \mathbf{0}$	$Y_{14} = \mathbf{0}$	$Z_5 = \mathbf{0}$