Problem   OilCo produces three types of gasoline: regular, unleaded, and premium. All three are produced by combining crude oil brought in from Alaska and Texas, along with a lead additive. The required sulphur content, octane levels, minimum daily demand (in gallons), and sales price per gallon of each type of gasoline are given in Table 1. The crude brought in from Alaska is made by blending two types of crude: Alaska1 and Alaska2. The Alaska crude is shipped via pipeline to Oilco's Texas refinery using a single pipeline with limited capacity. At most 10,000 gallons of crude per day can be shipped from Alaska. The sulphur content, octane level, daily maximum amount available (in gallons) and purchase cost (per gallon) for each type of Alaska crude, Texas crude, and lead are given in Table 2. We will assume that these properties "blend linearly." Of course, unleaded gasoline can contain no lead. Determine the production schedule which meets all these requirments and also maximize Oilco's daily profit obtained from producing and selling gasoline.

Completing the production schedule at the bottom will help you record some aspects of the solution, but you will also need to check all of the other requirements of the description above.

For class on Friday, bring one sheet of paper with your name, a production schedule, and the dollar amount you obtained for your best production schedule (no other work required). Place it on the front desk, before class begins.

Table 1

Type of Gasoline	Sulphur Content	Octane Level	Minimum Daily Demand	Sales Price
Regular	$< 3.0\%$	> 90	5000	$0.86
Unleaded	$< 3.0\%$	> 88	5000	$0.93
Premium	$< 2.8\%$	> 94	5000	$1.06

Table 2

Type of Input	Sulphur Content	Octane Level	Maximum Availability	Cost (per gallon)
Alaska1	4%	91	None	$0.78
Alaska2	1%	97	None	$0.88
Texas	2%	83	11,000	$0.75
Lead	0%	800	6000	$1.30

Production Schedule

	Regular	Unleaded	Premium	Cost
Alaska1				
Alaska2				
Texas				
Lead				
Revenue				

Profit = Revenue - Cost = $_____

Name: _____