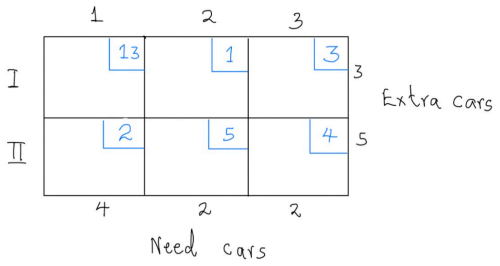
Problem Posing 2

Instructions:

- Download the pdf of this document. Look for a PDF link on the right of this page.
- Write your responses in the spaces provided. You may add an extra pages if you need more space. You may write digitally (using ipad/tablet) or type directly in the pdf. If your handwriting is hard to read, I suggest you type your responses. Otherwise, I may return the assignment to you.
- Scan your work (if you need to) then upload to Canvas.

Task 1

Consider the following transportation problem tableau. Create an easy problem and a challenging problem based on the tableau. For each problem, describe briefly why the problem is easy/challenging. The potential solvers of the problems you write are your classmates. - Easy Problem:



- Easy Problem:

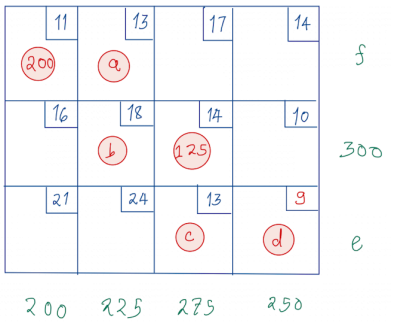
Explain briefly why the problem is easy. Be as specific as possible.

- Challenging Problem:

Explain briefly why the problem is challenging. Again, be as specific as possible.

Task 2

A student used the northwest corner rule to come up with a shipment plan. Accidentally, several numbers were erased from the tableau. The missing numbers are labelled as a, b, c,... to g.



a. Find the missing numbers (a) through (f). Explain briefly how you came up with the numbers.

b. Given that the total shipment cost for the plan in (a) is 12,200,000, find the value of g, the unit cost of transportation from factory III to store 4. Note that the transportation costs indicated on the tableau are in thousands of dollars.

Task 3

Modify the following payoff matrix such that the 3 in row 2 becomes a saddle point. Explain how you arrived at your new payoff matrix.

$$\begin{bmatrix} -9 & -7 & -9 & 7 \\ -1 & 0 & 8 & 3 \\ 5 & 4 & -3 & -2 \end{bmatrix} \tag{1}$$

Task 4

Pose a challenging **real-world** mathematical problem for which the payoff matrix below would be appropriate. Explain why your posed problem is challenging by highlighting possible errors that a solver could make.

		Selling during	
		Rain	Shine
Buying for	Rain	3,500	-4,500
	Shine	-4,500	6,000