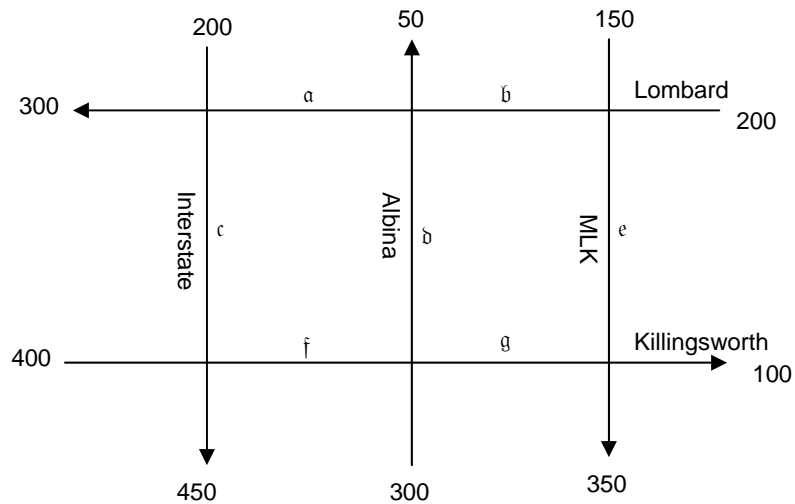


Project 1: Application of Linear Systems- Choosing the optimal Store Location
(125 Points)

You are considering opening up a drive thru coffee shop somewhere near the Cascade Campus. The scripted letters represent possible coffee shop locations. You want to optimize the number of your potential customers by choosing a location that is passed by the most number of cars.

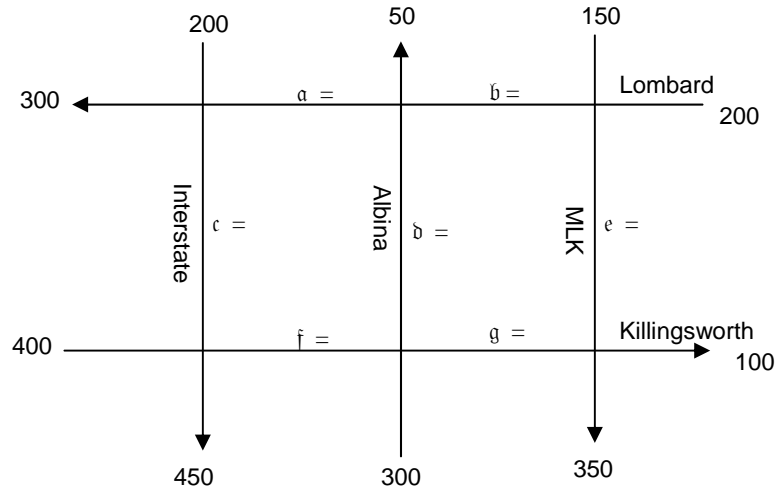
The city provides you the following traffic flow information, where the numbers represent the average number of cars per hour that enter or leave the given street between 6-7 a.m.



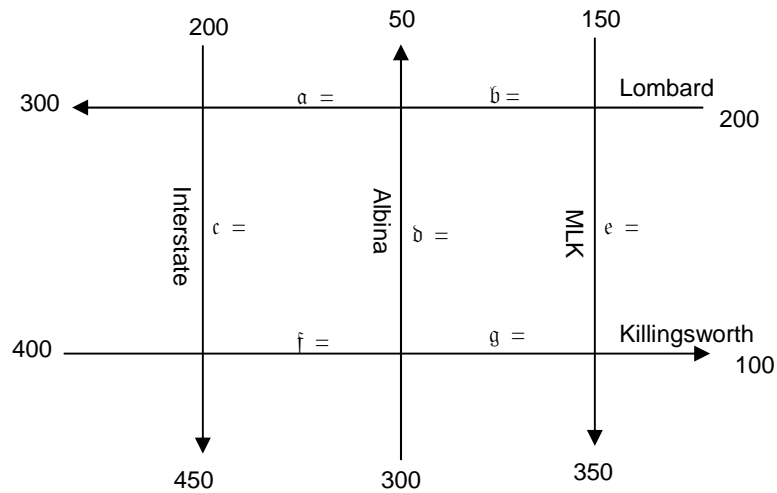
1) Write out a system of equations and the augmented matrix that describes the traffic flow. **(25 points)**

2) Using your augmented matrix find all solutions to the traffic flow. **(30 points)**

- 3) While you were getting the traffic flow information from the city they also informed you that Killingsworth between Interstate and Albina was going to be shut down for construction for at least two months. Give a particular solution to the traffic flow during construction. **(20 points)**



- 4) You also want to consider the solution when Killingsworth is not under construction. One morning you estimate that 450 cars pass on Killingsworth between Interstate and Albina between 6-7 a.m. Give a particular solution to the traffic flow when Killingsworth is not under construction. **(20 Points)**



5) (30 points)

You were given the following estimated monthly rental rates for each of the locations:

a= \$450 /month

b= \$200 /month

c= \$350 /month

d= \$500 /month

e= \$300 /month

f= \$450 /month

g= \$200 /month

Using this information and the solutions to question (2), (3) and (4) choose a location for your coffee shop. (There isn't necessarily a right or wrong answer.) Explain your decision.