1.   After taking a nutrition class, a big macaroni and cheese fan decides to improve the levels
        of protein and fiber in her favorite lunch by adding broccoli and canned chicken. The
        nutritional information for the foods referred to in this exercise is given in the table
        below.
        Nutrition Information per Serving

Nutrient	Mac and Cheese	Broccoli	Chicken	Shells
Calories	268	50	71	258
Protein (g)	9	5.4	14	8
Fiber (g)	2	5.2	0	5

a.   If she wants to limit her lunch to 410 calories but get 25 grams of protein and 10 grams
        of fiber, what proportions of servings of macaroni and cheese, broccoli, and chicken
        should she use?

b.   She found that there was too much broccoli in the proportions from part (a), so she
        decided to switch from classical macaroni to whole wheat shells. What proportions of
        servings of each food should she use to meet the same goals as in part (a)?

2.   Write a matrix equation that
        determines the loop currents shown to
        the right.
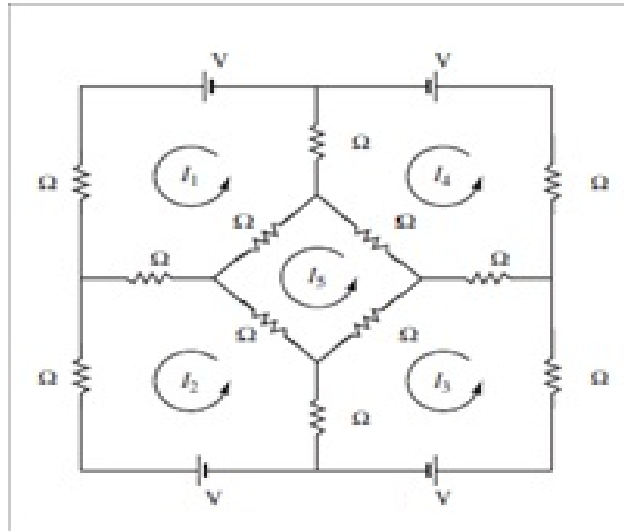
3.   In a certain region, about 8% of a city's population moves to the surrounding suburbs each year, and about 2% of the suburban population moves into the city. In 2010, there were 1,200,000 residents in the city and 550,000 residents in the suburbs. Set up a difference equation that describes this situation, where x_0 is the initial population in 2010. Then estimate the populations in the city and in the suburbs two years later, in 2012 (Ignore other factors that might influence the population sizes.)

4.   A car rental service in a certain town has a fleet of about 500 cars, at three locations. A car rented at one location may be returned to any of the three locations. The various fractions of cars returned to the three locations are shown in the matrix to the right. Suppose that on Monday there are 295 cars at the airport (or rented from there), 65 cars at the east side office, and 140 cars at the west side office. What will be the approximate distribution of cars on? Wednesday?

Cars Rented From:

Airport	East	West	Returned To:
0.91	0.05	0.08	Airport
0.00	0.90	0.04	East
0.09	0.05	0.88	West