

# MAT 116E Advanced Scientific and Engineering Computing

## Lab-9 / CRN : 12852

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Instructor: Assoc. Prof. Dr. Burcu Tunga

Lab Assistant: Res. Asst. Ahmet Topal

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### 1 Question 1

- a.) Three friends want to buy some beverages such as water, tea and coffee. The table below shows how many beverages bought by them.

	Water	Tea	Coffee
Victoria	3	2	1
Jun	4	3	1
Henare	3	1	0

As a result of shopping, Victoria, Jun and Henare are paid 16\$, 21.7\$ and 12.1\$, respectively. Write a MATLAB script to find the price of the beverages by using **Cramer's Rule**.

### 2 Question 2

In Linear Algebra, there are three cases for the solution of linear equation systems. That is, A linear equation system has no solution, exactly one solution or infinitely many solutions. Consider a linear equation system as

$$A \cdot x = B$$

where  $A$  is the coefficient matrix,  $x$  is the matrix of the unknown variables and  $B$  is the right hand side constants of the linear equation system. Let  $A|B$  be the augmented matrix. When rank of  $A$  is less than rank of  $A|B$ , then it has no solution. Otherwise, when they are equal to each other, If the number of unknown variables is greater than rank of  $A$  or  $A|B$ , then it has infinitely many solutions. If the number of unknown variables equals rank of  $A$  or  $A|B$ , then it has exactly one solutions.

Write a MATLAB function named **LinSysSolType** that takes input arguments  $A$  and  $B$  and evaluates type of solution of linear equation system