

# Assignment No.1

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Download all python codes from

[https://github.com/Abhishek7008/Assignment\\_1.git](https://github.com/Abhishek7008/Assignment_1.git)

and latex-tikz codes from

[https://github.com/Abhishek7008/Assignment\\_1.git](https://github.com/Abhishek7008/Assignment_1.git)

$$\begin{pmatrix} 1 & 1 & 12 \\ -1 & 1 & 2 \end{pmatrix} \xleftrightarrow{R_1 \leftarrow R_2 + R_1} \begin{pmatrix} 1 & 1 & 12 \\ 0 & 2 & 14 \end{pmatrix} \quad (2.0.4)$$

$$\begin{pmatrix} 1 & 1 & 12 \\ 0 & 2 & 14 \end{pmatrix} \xleftrightarrow{R_2 \leftarrow \frac{1}{2}R_2} \begin{pmatrix} 1 & 1 & 12 \\ 0 & 1 & 7 \end{pmatrix} \quad (2.0.5)$$

$$\begin{pmatrix} 1 & 1 & 12 \\ 0 & 1 & 7 \end{pmatrix} \xleftrightarrow{R_1 \leftarrow R_1 - R_2} \begin{pmatrix} 1 & 0 & 5 \\ 0 & 1 & 7 \end{pmatrix} \quad (2.0.6)$$

$$\Rightarrow \mathbf{x} = \begin{pmatrix} 5 \\ 7 \end{pmatrix} \quad (2.0.7)$$

## 1 QUESTION No.1

The sum of the digits of a two-digit number is 12. The number obtained by interchanging the two digits exceeds the given number by 18. Find the number ?.

$$\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 5 \\ 7 \end{pmatrix}$$

As Required Number  $(10x + y)$

$$\Rightarrow 10(5) + y = 57$$

Hence, the required number is 57.

## 2 SOLUTION

Let the tens digit of the required number be  $x$  and the units digit be  $y$ . Then,

$$x + y = 12 \quad (2.0.1)$$

Required Number =  $(10x + y)$

Number obtained on reversing the digits =  $(10y + x)$

Therefore,

$$\Rightarrow (10y + x) - (10x + y) = 18$$

$$\Rightarrow 9y - 9x = 18$$

$$\Rightarrow y - x = 2 \quad (2.0.2)$$

Solving 2.0.1 and 2.0.2, can be expressed as a Matrix Equation

$$\begin{pmatrix} 1 & 1 \\ -1 & 1 \end{pmatrix} \mathbf{x} = \begin{pmatrix} 12 \\ 2 \end{pmatrix} \quad (2.0.3)$$

The augmented matrix for the above equation is row reduced as follows