Assignment 10

K.A. Raja Babu

Download all python codes from

https://github.com/ka−raja−babu/Matrix−Theory/tree/main/Assignment10/Codes

and latex-tikz codes from

https://github.com/ka−raja−babu/Matrix−Theory/tree/main/Assignment10

1 Question No. 2.56

Two farmers Ramkishan and Gurcharan Singh cultivates only three varieties of rice namely Basmati, Permal and Naura. The sale (in Rupees) of these varieties of rice by both the farmers in the month of September and October are given by the following matrices $\mathbf{A}$ and $\mathbf{B}$.

September Sales(in Rupees)

$$\mathbf{A} = \begin{array}{c} \begin{matrix} \text{Basmati} & \text{Permal} & \text{Naura} \end{matrix} \\ \begin{pmatrix} 10000 & 20000 & 30000 \\ 50000 & 30000 & 10000 \end{pmatrix} \end{array} \begin{pmatrix} \text{Ramkishan} \\ \text{Gurucharan Singh} \end{pmatrix} \tag{1.0.1}$$

October Sales(in Rupees)

$$\mathbf{B} = \begin{array}{c} \begin{matrix} \text{Basmati} & \text{Permal} & \text{Naura} \end{matrix} \\ \begin{pmatrix} 5000 & 10000 & 6000 \\ 20000 & 10000 & 10000 \end{pmatrix} \end{array} \begin{pmatrix} \text{Ramkishan} \\ \text{Gurucharan Singh} \end{pmatrix} \tag{1.0.2}$$

(i) Find the combined sales in September and October for each farmer in each variety.
(ii) Find the decrease in sales from September to October.
(iii) If both farmers receive 2% profit on gross sales, compute the profit for each farmer and for each variety sold in October.

2 Solution

(i)Combined sales in September and October is given by

$$\mathbf{A} + \mathbf{B} = \begin{array}{c} \begin{matrix} \text{Basmati} & \text{Permal} & \text{Naura} \end{matrix} \\ \begin{pmatrix} 15000 & 30000 & 36000 \\ 70000 & 40000 & 20000 \end{pmatrix} \end{array} \begin{pmatrix} \text{Ramkishan} \\ \text{Gurucharan} \end{pmatrix} \tag{2.0.1}$$

(ii)Decrease in sales from September to October is given by

$$\mathbf{A} - \mathbf{B} = \begin{array}{c} \begin{matrix} \text{Basmati} & \text{Permal} & \text{Naura} \end{matrix} \\ \begin{pmatrix} 5000 & 10000 & 24000 \\ 30000 & 20000 & 0 \end{pmatrix} \end{array} \begin{pmatrix} \text{Ramkishan} \\ \text{Gurucharan} \end{pmatrix} \tag{2.0.2}$$

(iii)Profit for sales in October is given by

$$\frac{2}{100}\mathbf{B} = \begin{array}{c} \begin{matrix} \text{Basmati} & \text{Permal} & \text{Naura} \end{matrix} \\ \begin{pmatrix} 100 & 200 & 120 \\ 400 & 200 & 200 \end{pmatrix} \end{array} \begin{pmatrix} \text{Ramkishan} \\ \text{Gurucharan Singh} \end{pmatrix} \tag{2.0.3}$$

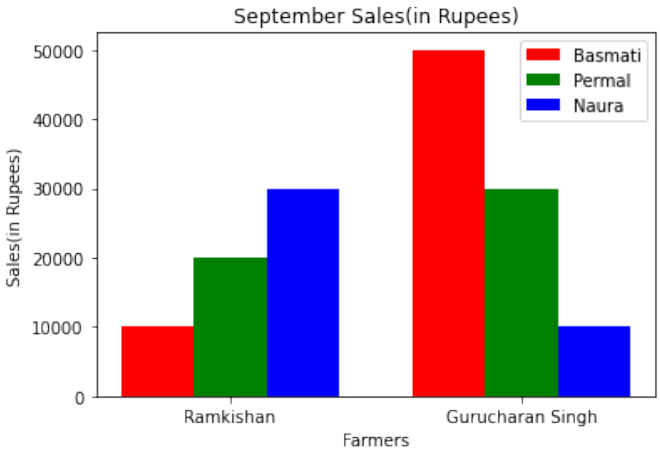

Fig. 2.1: September Sales(in Rupees)

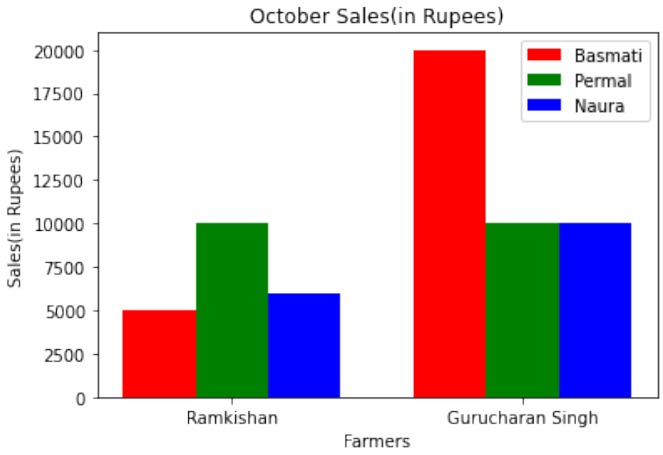

Fig. 2.2: October Sales(in Rupees)

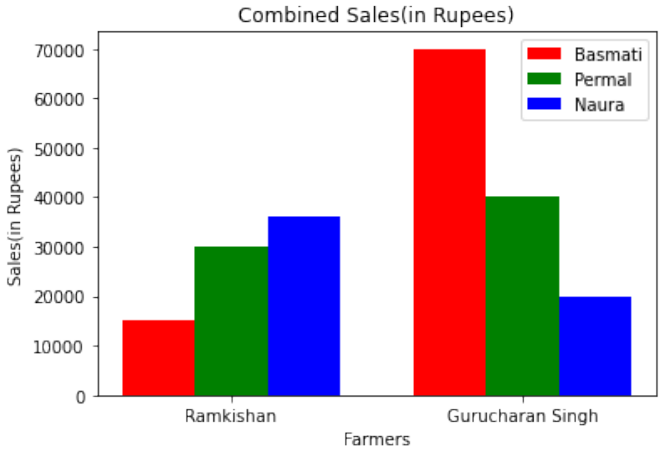

Fig. 2.3: Combined Sales(in Rupees)

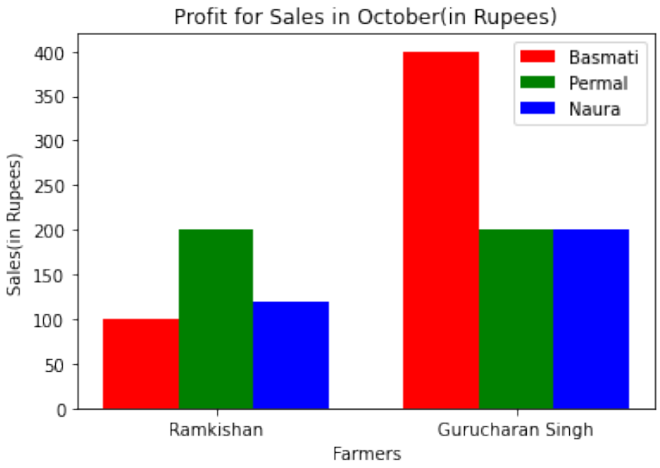

Fig. 2.5: Profit for Sales in October(in Rupees)

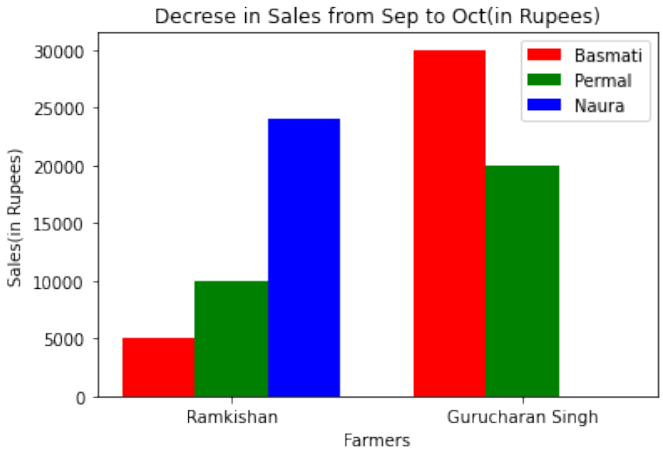

Fig. 2.4: Decrease in Sales from Sept to Oct(in Rupees)