

Step-1

Let us consider the 7×7 matrix with 15 1s.

Now, according to weak duality property, *if there are k lines to cover all the 1s of the matrix, there are k marriages possible.*

Now, the worst arrangement (giving the minimum number of marriages) of all the 1s of the matrix in the data is shown below.

$$C = \begin{bmatrix} 1 & 1 & 1 & 1 & 1 & 1 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 1 & 1 & 1 & 1 & 1 & 1 & 1 \end{bmatrix}$$

In the matrix, maximum 1s are in one line.

But, still it occupies 3 lines.

Thus, by the theorem, at least 3 marriages are possible.