Lab on Basic solution:

For a system of linear equations $Ax = b$ with n variables and $m \leq n$ constraints, set $n - m$ non-basic variables equal to zero and solve the remaining m basic variables. Find all basic solutions for the following set of equations.

1. $x + y = 4, x - 2y = 2, 2x + y = 2, x, y \geq 0$.

2. $x1 - 3x3 + 3x4 = 6, x2 - 8x3 + 4x4 = 4, xj \geq 0 \ (j = 1, 2, 3, 4)$.

3. $x1 - x2 = 0, x1 + x2 + x3 = 1, xj \geq 0 \ (j = 1, 2, 3)$

4. $10x1 + 5x2 + 25x3 + 3x4 = 50, 12x1 + 4x2 + 12x3 + x4 = 48, 7x1 + x4 = 35, xj \geq 0 \ (j = 1, 2, 3, 4)$

5. $2x1 + 3x2 + 4x3 = 5, 3x1 + 4x2 + 5x3 = 6.xj \geq 0 \ (j = 1, 2, 3)$

6. $2x1 + x2 + 4x3 = 11, 3x1 + x2 + 5x3 = 14, xj \geq 0 \ (j = 1, 2, 3)$

7. $3x1 + x2 + 5x3 + x4 = 12, 2x1 + 4x2 + x3 + 2x5 = 8, xj \geq 0 \ (j = 1, 2, 3, 4, 5)$

8. $2x1 + 6x2 + 2x3 + x4 = 3, 6x1 + 4x2 + 4x3 + 6x4 = 2, xj \geq 0 \ (j = 1, 2, 3, 4)$