

PROBLEM 1

```
> result2;
$variables
[1] "x1" "x2" "x3" "x4" "x5" "x6" "x7"

$augcoeffMatrix
      x1  x2      x3      x4      x5      x6      x7      RHS
1 10000  0 3100.000  0.000 2600.000 1300.0000 350.0000 78300000
2      0 8700 3217.000 5100.000 1582.000 -209.0000 -225.5000 79351000
3      0  0 -5012.368 1537.931 1806.943  469.5632  414.5287 11861287
4      0  0      0.000 5263.438 2571.960 1414.1581  349.6817 71900509
5      0  0      0.000  0.000 1957.996 1776.8988  909.5977 47055771
6      0  0      0.000  0.000  0.000  972.4694  517.1846 17451514
7      0  0      0.000  0.000  0.000  0.0000 -481.2421 -6737389

$solution
[1] 2500 3100 4500 6000 8000 10500 14000

>
> result3 <- GaussJordanMethod(result1);
> result3;
$variables
[1] "x1" "x2" "x3" "x4" "x5" "x6" "x7"

$augcoeffMatrix
      x1 x2 x3 x4 x5 x6 x7  RHS
1  1  0  0  0  0  0  0  2500
2  0  1  0  0  0  0  0  3100
3  0  0  1  0  0  0  0  4500
4  0  0  0  1  0  0  0  6000
5  0  0  0  0  1  0  0  8000
6  0  0  0  0  0  1  0 10500
7  0  0  0  0  0  0  1 14000

$solution
[1] 2500 3100 4500 6000 8000 10500 14000
```

Picture 1. Snapshot of Gaussian (top) and Gauss-Jordan (below) for ticket problem.

Based on the Gaussian and Gauss-Jordan matrix solution, ABI Entertainment should price Homeless Children concert tickets as follows to obtain the profit given the constraints of the different venue capacities:

Gen. Ad.	2500
Upper Box B	3100
Upper Box A	4500
Lower Box B	6000
Lower Box A	8000
VIP	10500
Royalty	14000

Table 1. Ticket prices of Homeless Children concert tickets.

PROBLEM 2

```

R4.5.1 C:/Users/roby/Desktop/...
$variables
[1] "x1" "x2" "x3" "x4" "x5" "x6" "x7" "x8" "x9"

$augcoeffMatrix
      x1    x2    x3    x4    x5    x6    x7    x8    x9    RHS
1  4 -1.00  0.000000 -1.00000000  0.0000000  0.00000000  0.00000000  0.00000000  0.00000000  80.00000
2  0  3.75 -1.000000 -0.25000000 -1.0000000  0.00000000  0.00000000  0.00000000  0.00000000  50.00000
3  0  0.00  3.733333 -0.06666667 -0.2666667 -1.00000000  0.00000000  0.00000000  0.00000000  93.33333
4  0  0.00  0.000000  3.73214286 -1.0714286 -0.01785714 -1.00000000  0.00000000  0.00000000  75.00000
5  0  0.00  0.000000  0.00000000  3.4066986 -1.07655502 -0.28708134 -1.00000000  0.00000000  41.53110
6  0  0.00  0.000000  0.00000000  0.0000000  3.39185393 -0.09550562 -0.3160112 -1.00000000  88.48315
7  0  0.00  0.000000  0.00000000  0.0000000  0.00000000  3.70517598 -1.0931677 -0.02815735  146.08696
8  0  0.00  0.000000  0.00000000  0.0000000  0.00000000  0.00000000  3.3544926 -1.10147519  133.53599
9  0  0.00  0.000000  0.00000000  0.0000000  0.00000000  0.00000000  0.0000000  3.34328358  191.04478

$solution
[1] 42.85714 41.42857 42.85714 50.00000 50.00000 50.00000 57.14286 58.57143 57.14286

>
> result3 <- GaussJordanMethod(result1);
> result3;
$variables
[1] "x1" "x2" "x3" "x4" "x5" "x6" "x7" "x8" "x9"

$augcoeffMatrix
      x1    x2    x3    x4    x5    x6    x7    x8    x9    RHS
1  1  0  0  0  0  0  0  0  0  0  42.85714
2  0  1  0  0  0  0  0  0  0  0  41.42857
3  0  0  1  0  0  0  0  0  0  0  42.85714
4  0  0  0  1  0  0  0  0  0  0  50.00000
5  0  0  0  0  1  0  0  0  0  0  50.00000
6  0  0  0  0  0  1  0  0  0  0  50.00000
7  0  0  0  0  0  0  1  0  0  0  57.14286
8  0  0  0  0  0  0  0  1  0  0  58.57143
9  0  0  0  0  0  0  0  0  1  0  57.14286

$solution
[1] 42.85714 41.42857 42.85714 50.00000 50.00000 50.00000 57.14286 58.57143 57.14286

```

Picture 2. Snapshot of Gaussian (top) and Gauss-Jordan (below) for temperature problem.

Based on the Gaussian and Gauss-Jordan matrix solution, the equilibrium temperatures at the internal points of the plate are determined and as follows. The equations were obtained through the property of each point and shown in the photo below.

x1 42.85714	x2 41.42587	x3 42.85714
x4 50.0000	x5 50.0000	x6 50.000
x7 57.14286	x8 58.57143	x9 57.14286

Table 2. Temperature in each of the internal points.

BANTUAN AXEL D.

$$\begin{aligned}
 x_1 &= (x_2 + x_4 + 30 + 50) / 4 \\
 x_2 &= (x_1 + x_5 + x_3 + 30) / 4 \\
 x_3 &= (x_2 + x_6 + 50 + 30) / 4 \\
 x_4 &= (x_1 + x_5 + x_7 + 50) / 4 \\
 x_5 &= (x_2 + x_4 + x_6 + x_9) / 4 \\
 x_6 &= (x_3 + x_5 + x_9 + 50) / 4 \\
 x_7 &= (x_4 + x_8 + 70 + 50) / 4 \\
 x_8 &= (x_5 + x_9 + x_7 + 70) / 4 \\
 x_9 &= (x_6 + x_8 + 70 + 50) / 4
 \end{aligned}$$

$$\begin{aligned}
 E1 \quad & 4x_1 - x_2 - x_4 = 80 \\
 E2 \quad & 4x_2 - x_1 - x_5 - x_3 = 50 \\
 E3 \quad & 4x_3 - x_2 - x_6 = 80 \\
 E4 \quad & 4x_4 - x_1 - x_5 - x_7 = 50 \\
 E5 \quad & 4x_5 - x_2 - x_4 - x_9 - x_6 = 50 \\
 E6 \quad & 4x_6 - x_3 - x_5 - x_9 = 50 \\
 E7 \quad & 4x_7 - x_4 - x_8 = 120 \\
 E8 \quad & 4x_8 - x_5 - x_9 - x_7 = 70 \\
 E9 \quad & 4x_9 - x_6 - x_8 = 120
 \end{aligned}$$

Picture 3. Derivation of equations.