```
disp('Nicolas Cedillo')
Nicolas Cedillo
dis('N
 dis('N
      ↑
{ Error: Character vector is not terminated properly.
}
disp('Nicolas Cedillo')
Nicolas Cedillo
disp('NRC: 7543')
NRC: 7543
date

ans =

    '11-Jan-2022'

clock

ans =

   1.0e+03 *

  Columns 1 through 4

    2.022000000000000   0.001000000000000   0.011000000000000
0.010000000000000

  Columns 5 through 6

   0.002000000000000   0.024418000000000


disp('Ejercicio 1')
Ejercicio 1
disp('niño')
niño
x = [13 6 8 9 12 8 8 6 8]

x =

    13     6     8     9    12     8     8     6     8

y = [2.1 2.6 3.8 3.8 4 4 4 4.2 4.9]

y =

  Columns 1 through 6

    2.1000    2.6000    3.8000    3.8000    4.0000    4.0000

  Columns 7 through 9

    4.0000    4.2000    4.9000

M = [x' y']
```

```
M =

    13.0000    2.1000
     6.0000    2.6000
     8.0000    3.8000
     9.0000    3.8000
    12.0000    4.0000
     8.0000    4.0000
     8.0000    4.0000
     6.0000    4.2000
     8.0000    4.9000

help fac
  <strong>fac</strong> Resuleve el ajuste de curvas
  <strong>Modos de entrada</strong>
  [X,Y,r] = <strong>fac</strong>(M)
  [X,Y,r,Ec,Ea,Er] = <strong>fac</strong>(M,m)
  [X,Y,r,Ec,Ea,Er,y] = <strong>fac</strong>(M,m,x)

  <strong>Valores de entrada</strong>
  <strong>M:</strong> Matriz de pares ordenados [xi;yi]
  <strong>m:</strong> Tipo de ajuste:
    0 - Lineal
    1 - Cuadratico
    2 - Cubico
    3 - Exponencial
  <strong>x:</strong> Valor a comprovar dentro del ajuste ya efectuado

  <strong>Valores de Salida</strong>
  <strong>X:</strong> Lista de puntos en x
  <strong>Y:</strong> Lista de puntos en y
  <strong>r:</strong> Coeficiente de correlacion -1 < r < 1
  <strong>Ec:</strong> Ecuacion nde regresion
  <strong>Ea:</strong> Error absoluto
  <strong>Er:</strong> Error relativo
  <strong>y:</strong>  Valor de Ec evaluado en x

fac(M)
    -0.3423

fac(M)
    -0.3423

Elapsed time is 3.241827 seconds.
disp('aqui va la figura 1')
aqui va la figura 1
```
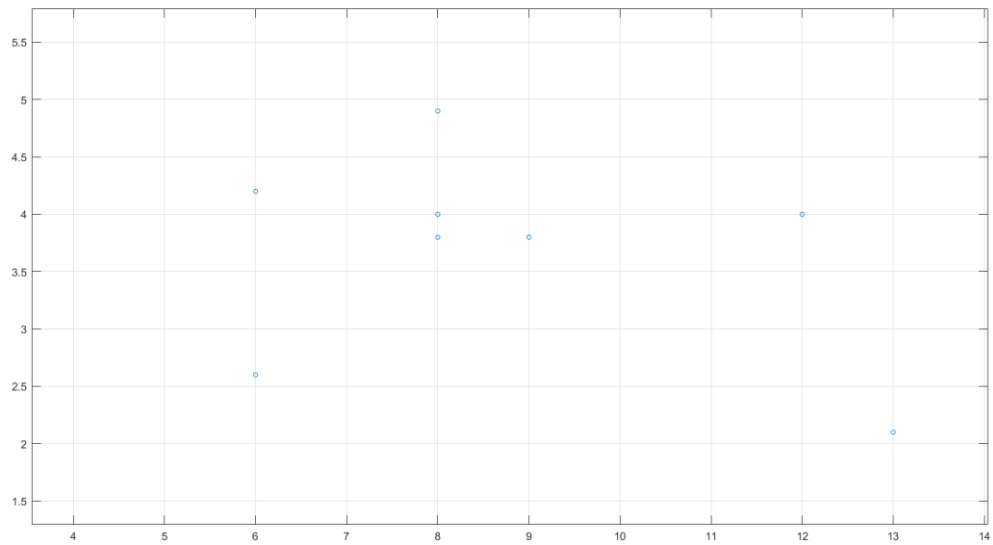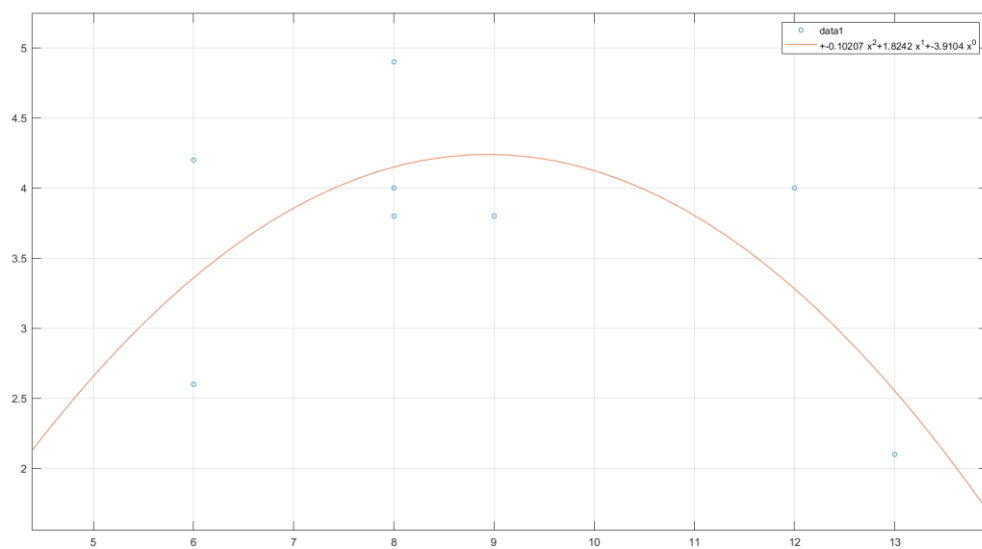
```
fac(M)
    -0.3423

fac(M)
    -0.3423

Elapsed time is 0.255166 seconds.
fac(M,1)
    -0.3423

fac(M,m)
Ajuste cuadratico
- 0.10207*x^2 + 1.8242*x - 3.9104
```

Considerar z número de horas utilizando moviles considerando la variable logica Y como niñas (F) niños (V) y la edad x

Obsevar el vecto (x,y,z) con valores (x,y,z)

z: 2.1   2.6   3   3.5   3.8 3,8   4   4   4   4.2   4.2   4,3
    4,3   4,4   4,5   4,6   4,6   4,7   4,9   5

Y: V V   F F   V V V   V V   F V   F F F F F F   F V F

x: 13   6   5 5 . 8   9   12   8   8   7 6   7 7   8 7 7 7

6   8   10

X	Y	X^2	X^3	X^4	XY	X^2Y
13	2.1	169	2197	361	27.3	355
6	2.6	36	216	1296	15.6	94
8	3.8	64	512	4096	30.4	293
9	3.8	81	729	6561	36	324
12	4	144	1728	20736	48	576
8	4	64	512	4096	32	256
8	4	64	512	4096	32	256
6	4.2	36	216	1296	25.2	151
8	4.9	64	512	4096	39.2	314
78	33.4	722	7139	94839	283	2552

$$\sum_{i=1}^{n} \{ a_0 + x_i a_1 + x_i^2 a_2 = y_i \}$$

(1) $9a_0 + 78a_1 + 722a_2 = 33.6$

$$\sum_{i=1}^{n} \{ x_i a_0 + x_i^2 a_1 + x_i^3 a_2 = x_i y_i \}$$

(2) $78a_0 + 722a_1 + 7134a_2 = 285.7$

$$\sum_{i=1}^{n} \{ x_i^2 a_0 + x_i^3 a_1 + x_i^4 a_2 = x_i^2 y_i \}$$

(3) $722a_0 + 7139a_1 + 74839a_2 = 2569$

$a_0 = -3.910$

$a_1 = 1.824$

$a_2 = -0.102$

$y = -0.102x^2 + 1.824x - 3.9104$

[Warning: fplot will not accept character vector or string

```
inputs in a future release. Use
fplot(@(x)+-0.10207.*x.^2+1.8242.*x.^1+-3.9104.*x.^0) instead.]
[ > In <a
href="matlab:matlab.internal.language.introspective.errorDocCallback('fpl
ot', 'C:\Program
Files\Polyspace\R2020a\toolbox\matlab\graphics\function\fplot.m', 110)"
style="font-weight:bold">fplot</a> (<a href="matlab:
opentoline('C:\Program
Files\Polyspace\R2020a\toolbox\matlab\graphics\function\fplot.m',110,0)">
line 110</a>)
    In <a
href="matlab:matlab.internal.language.introspective.errorDocCallback('fac
/cuadratico', 'C:\Users\ismae\OneDrive\Documentos\MATLAB\Met.
Numericos\Grupal\Ajuste de Curvas\fac.m', 124)" style="font-
weight:bold">fac/cuadratico</a> (<a href="matlab:
opentoline('C:\Users\ismae\OneDrive\Documentos\MATLAB\Met.
Numericos\Grupal\Ajuste de Curvas\fac.m',124,0)">line 124</a>)
    In <a
href="matlab:matlab.internal.language.introspective.errorDocCallback('fac
', 'C:\Users\ismae\OneDrive\Documentos\MATLAB\Met.
Numericos\Grupal\Ajuste de Curvas\fac.m', 42)" style="font-
weight:bold">fac</a> (<a href="matlab:
opentoline('C:\Users\ismae\OneDrive\Documentos\MATLAB\Met.
Numericos\Grupal\Ajuste de Curvas\fac.m',42,0)">line 42</a>)]
Elapsed time is 5.154037 seconds.
legend
disp('niña')
niña
x1 = [5 5 7 7 7 8 7 7 7 6 10]

x1 =

  Columns 1 through 10

     5     5     7     7     7     8     7     7     7     6

  Column 11

    10

y1 = [3 3.5 4.2 4.3 4.3 4.4 4.5 4.6 4.6 4.7 5]

y1 =

  Columns 1 through 6

    3.0000    3.5000    4.2000    4.3000    4.3000    4.4000

  Columns 7 through 11

    4.5000    4.6000    4.6000    4.7000    5.0000

M1 = [x1' y1']

M1 =

    5.0000    3.0000
    5.0000    3.5000
```
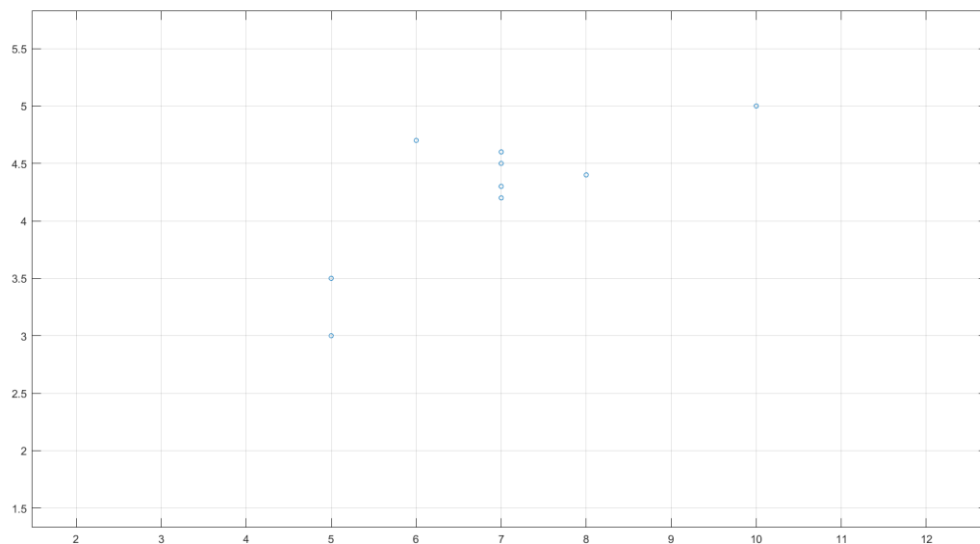
```
     7.0000     4.2000
     7.0000     4.3000
     7.0000     4.3000
     8.0000     4.4000
     7.0000     4.5000
     7.0000     4.6000
     7.0000     4.6000
     6.0000     4.7000
    10.0000     5.0000

fac(M1)
    0.7670


fac(M)
    0.7670


Elapsed time is 0.242680 seconds.
disp('aqui va la figura 3')
aqui va la figura 3
```



```
fac(M1,1)
    0.7670


fac(M,m)
Ajuste cuadratico
- 0.071735*x^2 + 1.3689*x - 1.6285


[ Warning: fplot will not accept character vector or string
inputs in a future release. Use
fplot(@(x)+-0.071735.*x.^2+1.3689.*x.^1+-1.6285.*x.^0) instead.]
[ > In <a
href="matlab:matlab.internal.language.introspective.errorDocCallback('fpl
ot', 'C:\Program
Files\Polyspace\R2020a\toolbox\matlab\graphics\function\fplot.m', 110)"
style="font-weight:bold">fplot</a> (<a href="matlab:
opentoline('C:\Program
Files\Polyspace\R2020a\toolbox\matlab\graphics\function\fplot.m',110,0)">
line 110</a>)
```

```
   In <a
href="matlab:matlab.internal.language.introspective.errorDocCallback('fac
/cuadratico', 'C:\Users\ismae\OneDrive\Documentos\MATLAB\Met.
Numericos\Grupal\Ajuste de Curvas\fac.m', 124)" style="font-
weight:bold">fac/cuadratico</a> (<a href="matlab:
opentoline('C:\Users\ismae\OneDrive\Documentos\MATLAB\Met.
Numericos\Grupal\Ajuste de Curvas\fac.m',124,0)">line 124</a>)
   In <a
href="matlab:matlab.internal.language.introspective.errorDocCallback('fac
', 'C:\Users\ismae\OneDrive\Documentos\MATLAB\Met.
Numericos\Grupal\Ajuste de Curvas\fac.m', 42)" style="font-
weight:bold">fac</a> (<a href="matlab:
opentoline('C:\Users\ismae\OneDrive\Documentos\MATLAB\Met.
Numericos\Grupal\Ajuste de Curvas\fac.m',42,0)">line 42</a>)]
Elapsed time is 0.545373 seconds.
legend
fac(M1,1)
    0.7670

fac(M,m)
Ajuste cuadratico
- 0.071735*x^2 + 1.3689*x - 1.6285
```
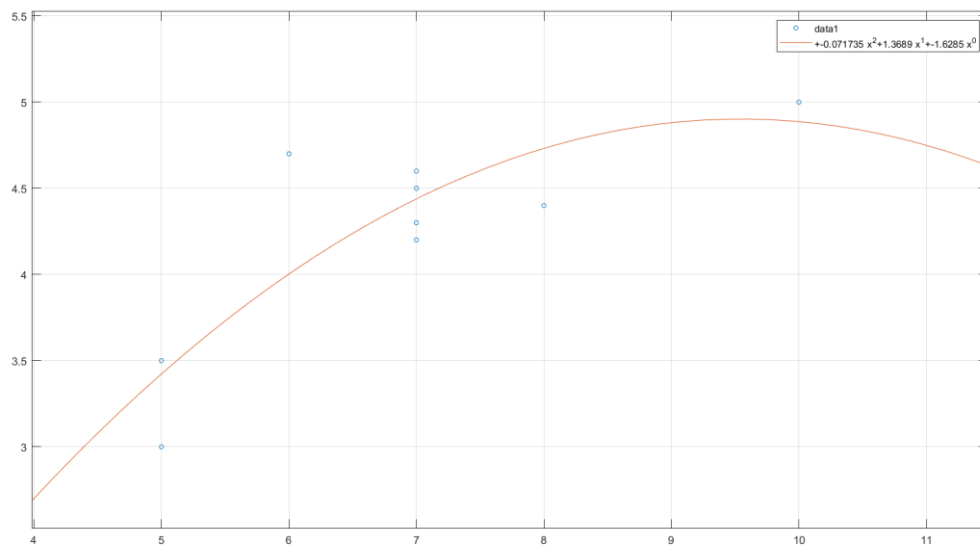
x	Y	x^2	x^3	x^4	xY	x^2Y
5	3	25	125	625	15	75
5	3.5	25	125	625	17.5	87.5
7	4.2	49	343	2401	29.4	205.8
7	4.3	49	343	2401	30.1	210.7
7	4.3	49	343	2401	30.1	210.7
8	4.4	64	512	4096	35.2	281.6
7	4.5	49	343	2401	31.5	220.5
7	4.6	49	343	2401	32.2	225.4
7	4.6	49	343	2401	32.2	225.4
6	4.7	36	216	1296	28.20	169.2
10	5	100	1000	10 000	50	500
76	47.1	544	4036	31 048	331.4	2411.80

$$11 a_0 + 76 a_1 + 544 a_2 = 47.1 \quad (1)$$

$$76 a_0 + 544 a_1 + 4036 a_2 = 331.4 \quad (2)$$

$$544 a_0 + 4036 a_1 + 31048 a_2 = 2411.80 \quad (3)$$

$$a_0 = -1.63$$

$$a_1 = 1.367 \qquad y = -0.072x^2 + 1.367x - 1.63$$

$$a_2 = -0.072$$

```
[ Warning: fplot will not accept character vector or string
inputs in a future release. Use
fplot(@(x)+-0.071735.*x.^2+1.3689.*x.^1+-1.6285.*x.^0) instead.]
[ > In <a
href="matlab:matlab.internal.language.introspective.errorDocCallback('fpl
ot', 'C:\Program
Files\Polyspace\R2020a\toolbox\matlab\graphics\function\fplot.m', 110)"
style="font-weight:bold">fplot</a> (<a href="matlab:
opentoline('C:\Program
Files\Polyspace\R2020a\toolbox\matlab\graphics\function\fplot.m',110,0)">
line 110</a>)
  In <a
href="matlab:matlab.internal.language.introspective.errorDocCallback('fac
/cuadratico', 'C:\Users\ismae\OneDrive\Documentos\MATLAB\Met.
Numericos\Grupal\Ajuste de Curvas\fac.m', 124)" style="font-
weight:bold">fac/cuadratico</a> (<a href="matlab:
opentoline('C:\Users\ismae\OneDrive\Documentos\MATLAB\Met.
Numericos\Grupal\Ajuste de Curvas\fac.m',124,0)">line 124</a>)
  In <a
href="matlab:matlab.internal.language.introspective.errorDocCallback('fac
', 'C:\Users\ismae\OneDrive\Documentos\MATLAB\Met.
Numericos\Grupal\Ajuste de Curvas\fac.m', 42)" style="font-
weight:bold">fac</a> (<a href="matlab:
opentoline('C:\Users\ismae\OneDrive\Documentos\MATLAB\Met.
Numericos\Grupal\Ajuste de Curvas\fac.m',42,0)">line 42</a>)]
Elapsed time is 0.479202 seconds.
legend
disp('aqui va la figura 4')
aqui va la figura 4
disp('Ejercicio 2')
Ejercicio 2
fmsl
<strong>Ingresa los parametros de manera correcta
</strong>disp('Cuando x3 = 3')
Cuando x3 = 3
A = [0.098 1.002 3;2.002 3.001 -1.001;3.002 4 0]


A =

    0.0980    1.0020    3.0000
    2.0020    3.0010   -1.0010
    3.0020    4.0000         0

B = [2;2;8.2299999]


B =

    2.0000
    2.0000
    8.2300


help fmsl
  <strong>fmsl</strong> resuelve un sistema de ecuaciones NxN

  [AX=B,Ea,Er] = <strong>fmsl</strong>(A,B,m,f)
  [AX=B,Ea,Er,Ec] = <strong>fmsl</strong>(A,B,m,f,n)
  [AX=B,Ea,Er,n] = <strong>fmsl</strong>(A,B,m,f,Ec)
```

```
  A: Una matriz NxN
  B: Una matriz 1xN
  m: El metodo para resolver el sistema (Integer)
    0 - Gauss
    1 - Gauss - Jordan
    2 - Gauss - Sediel
    3 - Descomposicion LU
    4 - Matriz Inversa
    5 - Todos los metodos

  f: Formato de decimales (Integer o String)
    0 - Short - 4 decimales
    1 - Long - 15 decimales
    2 - Bank - 2 decimales
    3 - Rat - Fraccion
    'eng' - Notacion Cientifica

  n: Numero de iteraccion para Gauss- Sediel(Integer)
  Ec: Error de calculo para Gauss- Sediel(Real)
```

```
fmsl(A,B,0,0)
fmsl(A,B,m,f)
```
format short
Gauss   Tabla Gauss
   xi   vt
ve   Ea
Er
    __   _____
_____   _____
_____

```
    x1      8.955       8.955              0              0
    x2    -4.6632     -4.6632     8.8818e-16    -1.9047e-16
    x3     1.9316      1.9316     2.2204e-16     1.1495e-16
```

```
A = [0.098 1.002 1;2.002 3.001 -1.001;3.002 4 0]

A =

    0.0980    1.0020    1.0000
    2.0020    3.0010   -1.0010
    3.0020    4.0000        0

fmsl(A,B,0,0)
fmsl(A,B,m,f)
```
format short
Gauss   Tabla Gauss
   xi   vt
ve   Ea
Er
    __   _____
_____   _____
_____

```
    x1     4.6814      4.6814     1.7764e-15     3.7945e-16
    x2    -1.4559     -1.4559     1.1102e-15    -7.6257e-16
    x3          3           3     8.8818e-16     2.9606e-16
```

```
disp('aqui va la figura 5')
aqui va la figura 5

disp('Matriz Inversa')
Matriz Inversa
fmsl(A,B,4,0)
fmsl(A,B,m,f)
```
**format short
****Matriz Inversa**
```
matrizInv =

   -1.1062   -1.1051    1.1062
    0.8302    0.8294   -0.5802
    0.2765   -0.7227    0.4730


X =

    4.6814
   -1.4559
    3.0000
```

Dado el sistema lineal

$$0,098 x_1 + 1,002 x_2 + x_3 = 2 \qquad K \in \mathbb{R}$$
$$2,002 x_1 + 3,001 x_2 - 1,001 x_3 = 2$$
$$3,002 x_1 + 4 x_2 \qquad = K$$

Gauss

$$\begin{bmatrix} 0,098 & 1,002 & 1 \\ 2,002 & 3,001 & -1,001 \\ 3,002 & 4 & 0 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 2 \\ 2 \\ K \end{bmatrix}$$

$$\begin{bmatrix} 0,098 & 1,002 & 1 \\ 2,002 & 3,001 & -1,001 \\ 3,002 & 4 & 0 \end{bmatrix} \quad F_2 \to F_2 - \left(\frac{143}{7}\right) F_1 \quad \begin{bmatrix} 0,098 & 1,002 & 1 & 2 \\ 0 & -17.47 & 21,43 & -\frac{273}{7} \\ 0 & -26,69 & -30,63 & K-61 \end{bmatrix}$$

$$\begin{bmatrix} 0,098 & 1,002 & 1 & 2 \\ -0 & -17,47 & 21,43 & -\frac{273}{7} \\ 0 & 0 & 2,11 & K-1.88 \end{bmatrix}$$

$$0,098 x_1 + 1,002 x_2 + x_3 = 2$$
$$0 \quad -17,47 x_2 + 21,43 = 38,86$$
$$0 \quad 0 \quad 2,11 x_3 = K - 1,88$$

Si $x_3 = 3 \to K = 8.2299$

$$x_2 = -1.456$$
$$x_1 = 4.682$$

```
disp('Cuando x3 = 0')
Cuando x3 = 0
A

A =

    0.0980    1.0020    1.0000
    2.0020    3.0010   -1.0010
    3.0020    4.0000         0

B

B =

    2.0000
    2.0000
    8.2300

disp('Descomposicion LU')
Descomposicion LU
fmsl(A,B,3,0)
fmsl(A,B,m,f)
<strong>format short
</strong><strong>Descomposicion LU
</strong>L
    1.0000         0         0
   30.6327    1.0000         0
   20.4286    0.6544    1.0000

U
    0.0980    1.0020    1.0000
         0  -26.6939  -30.6327
         0         0   -1.3836

x
    4.6814
   -1.4559
    3.0000

disp('Gauss Seidel')
Gauss Seidel
linsolve(A,B)

ans =

    4.6814
   -1.4559
    3.0000
```
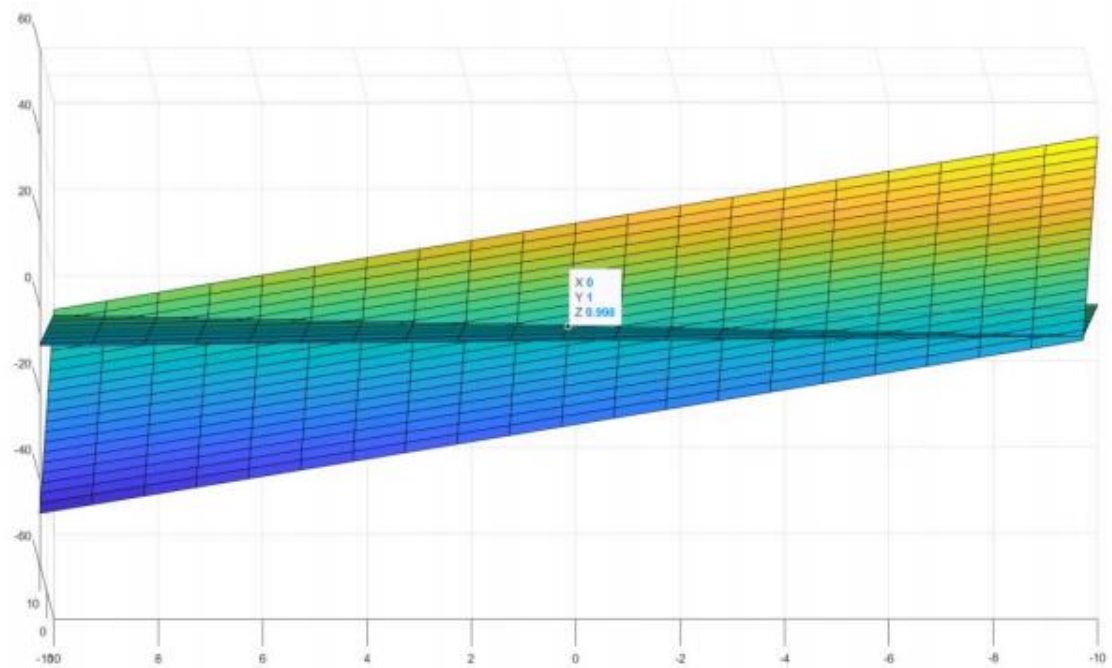
Matriz Inversa

$$A = \begin{pmatrix} 0,098 & 1,002 & 1 \\ 2,002 & 3,001 & -1,001 \\ 3,002 & 4 & 0 \end{pmatrix} \Rightarrow A^{-1} \begin{pmatrix} -1,1062 & -1,1051 & -1,1062 \\ 0,8302 & 0,8294 & -0,5862 \\ 0,2765 & -0,7227 & 0,4730 \end{pmatrix}$$

$$B = \begin{pmatrix} 2 \\ 2 \\ K \end{pmatrix} \quad x = A^{-1} B \Rightarrow x = \begin{pmatrix} 1,1062\,K - 4,4226 \\ -0,5802\,K + 3,3191 \\ 0,4730\,K - 0,8924 \end{pmatrix}$$

Sea $x_3 = 3 \Rightarrow K = 8,2299$

$x_2 = -1,455$

$x_1 = 4,6805$

LU

Extraigo la matriz de gauss

$$U = \begin{pmatrix} 0,098 & 1,002 & 1 & 2 \\ 0 & -17,96 & -21,42 & -38,857 \\ 0 & 0 & 2,1144 & K-1 \end{pmatrix}$$

$$L = \begin{pmatrix} 1 & 0 & 0 \\ 20,428 & 1 & 0 \\ 30,632 & 1,5281 & 1 \end{pmatrix}$$

Si $x_3 = 0$

$K = 1,8868$

$x_2 = 2,2214$

$x_1 = -2,3354$

Sistema

$$\begin{cases} 0,098 x_1 + 1,002 x_2 + x_3 = 2 & (1) \\ -17,468 x_2 - 21,42 x_3 = -38,8571 & (2) \\ 2,114 x_3 = K - 1,886 & (3) \end{cases}$$

diary off