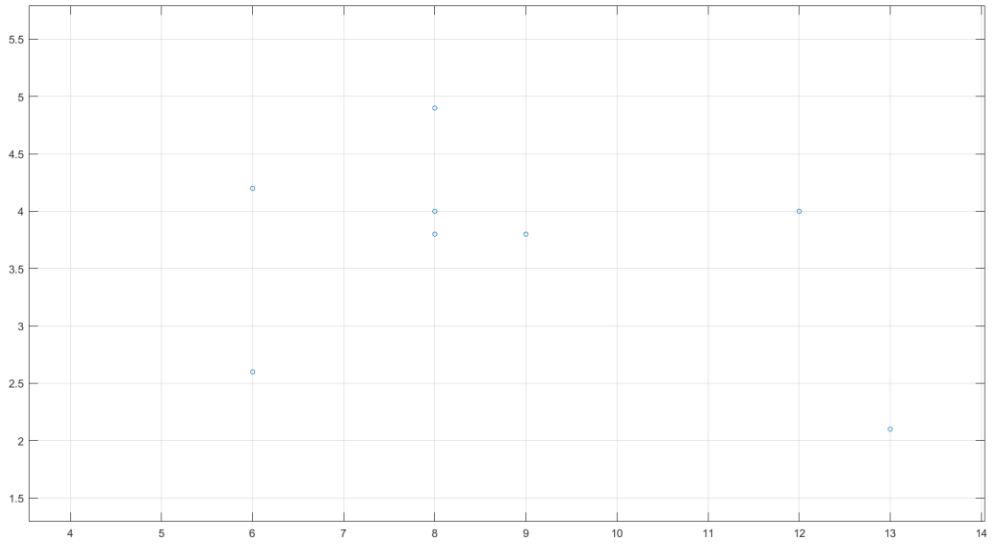
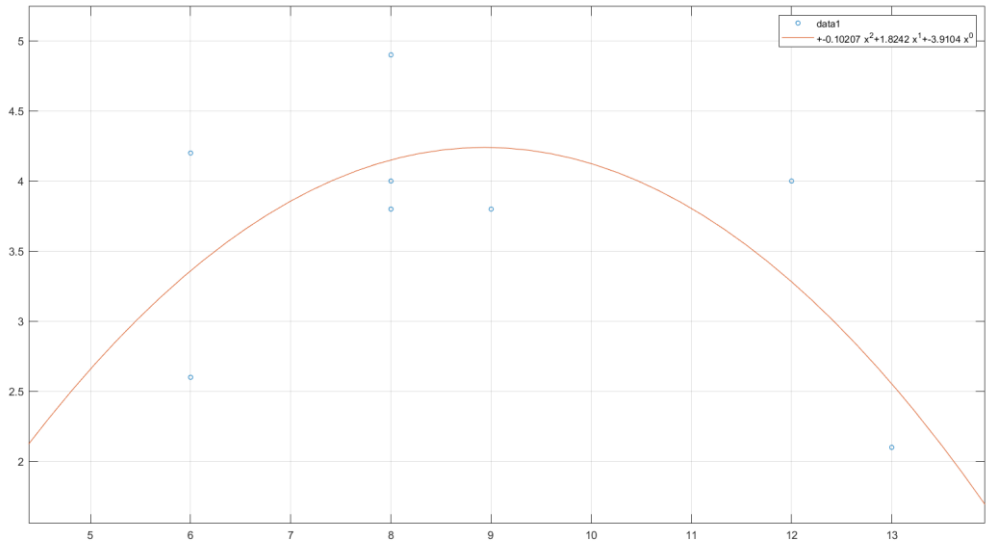
```
disp('Nicolas Cedillo')
Nicolas Cedillo
dis('N
 dis('N
     ↑
{ Error: Character vector is not terminated properly.
}
disp('Nicolas Cedillo')
Nicolas Cedillo
disp('NRC: 7543')
NRC: 7543
date

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
```



Plantel: Universidad de las fuerzas Armadas — Calificación:

Alumno: Ismael Cedillo — 11 / 01 / 2022 (DIA / MES / AÑO)

Curso: 7543 — Asignatura: Métodos Numericos

Profesor: Richard Banis — Firma Cedillo Paz

Considerar el número de horas utilizando moviles considerando la variable logica Y con niñas (F) niños (V) y la edad X

Observe 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	74834	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) $722a_0 + 7139a_1 + 74834a_2 = 2569$

$a_0 = -3.910$

$a_1 = 1.824$

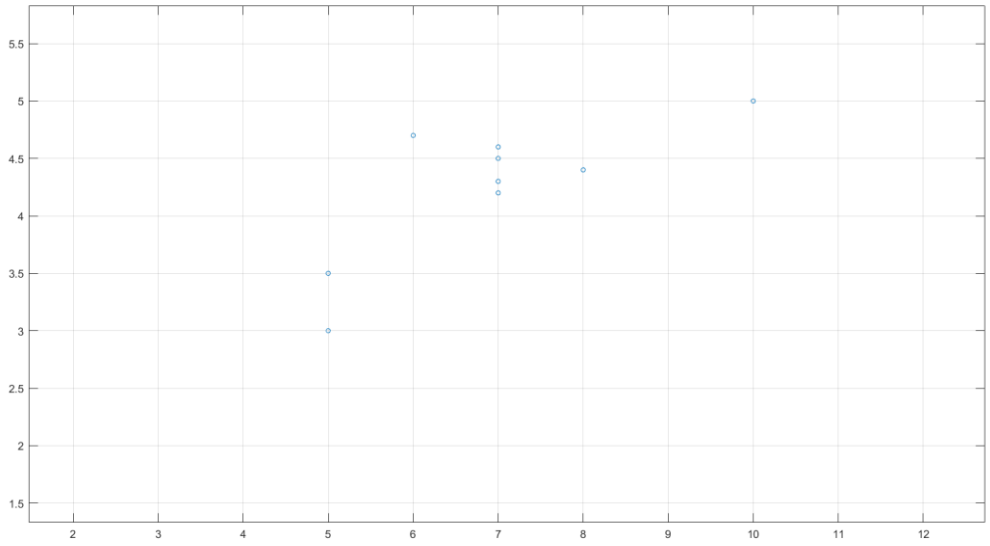
$a_2 = -0.102$

$y = -0.102x^2 + 1824x - 3.9104$

[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	4.9	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	10000	50	500
76	47.1	544	4036	31048	331.4	2411.80

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

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

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

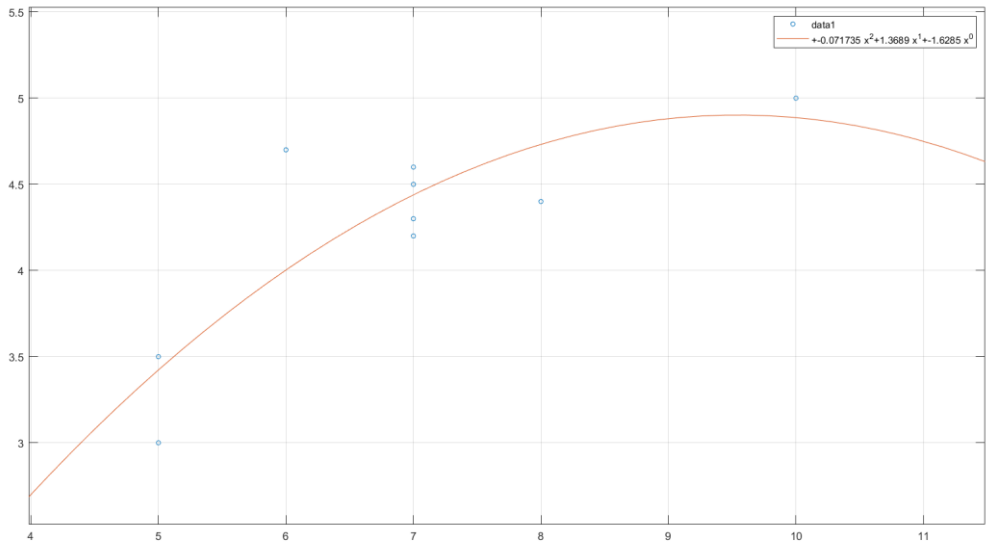
$a_0 = -1.63$

$a_1 = 1.367$

$a_2 = -0.072$

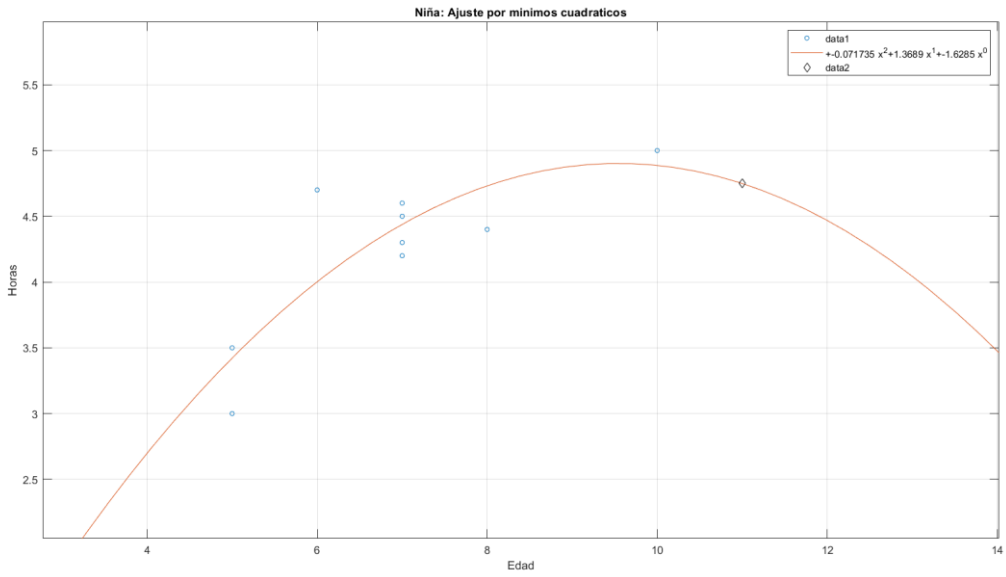
$y = -0.072x^2 + 1.367x - 1.63$

```
[ 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
```




```
fac(M1,1,11)
    0.7670
fac(M,m,x)
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', 61)" style="font-
weight:bold">fac</a> (<a href="matlab:
opentoline('C:\Users\ismae\OneDrive\Documentos\MATLAB\Met.
Numericos\Grupal\Ajuste de Curvas\fac.m',61,0)">line 61</a>)]

Valor de la función evaluada en 11
4.749465

Elapsed time is 0.476287 seconds.
xlabel('Edad')
ylabel('Horas')
title('Niña: Ajuste por minimos cuadraticos')
disp('Aqui va la fig 9')
Aqui va la fig 9
```



```
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)
<strong>format short
</strong><strong>Gauss</strong><strong>           Tabla Gauss
</strong>    <strong>xi</strong>      <strong>vt</strong>
<strong>ve</strong>           <strong>Ea</strong>
<strong>Er</strong>
```

```
    <strong>__</strong>    <strong>_______</strong>
<strong>_______</strong>    <strong>__________</strong>
<strong>___________</strong>

    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)
<strong>format short
</strong><strong>Gauss</strong><strong>           Tabla Gauss
</strong>    <strong>xi</strong>      <strong>vt</strong>
<strong>ve</strong>           <strong>Ea</strong>
<strong>Er</strong>
    <strong>__</strong>    <strong>_______</strong>
<strong>_______</strong>    <strong>__________</strong>
<strong>___________</strong>

    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)
<strong>format short
</strong><strong>Matriz Inversa</strong>
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

$$0{,}098x_1 + 1{,}002x_2 + x_3 = 2$$
$$2{,}002x_1 + 3{,}001x_2 - 1{,}001x_3 = 2$$
$$3{,}002x_1 + 4x_2 = K$$

$K \in \mathbb{R}$

Gauss

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

$$\begin{bmatrix} 0{,}098 & 1{,}002 & 1 \\ 2{,}002 & 3{,}001 & -1{,}001 \\ 3{,}002 & 4 & 0 \end{bmatrix} \quad F_2 \to F_2 - \left(\frac{143}{7}\right) F_1 \quad \left[\begin{array}{ccc|c} 0{,}098 & 1{,}002 & 1 & 2 \\ 0 & -17.97 & 21{,}43 & -\frac{272}{7} \\ 0 & -26{,}64 & -30.53 & K-6 \end{array}\right.$$

$$\left[\begin{array}{ccc|c} 0{,}098 & 1{,}002 & 1 & 2 \\ -0 & -17{,}97 & 21{,}93 & -272/7 \\ 0 & 0 & 2.11 & K-1.88 \end{array}\right]$$

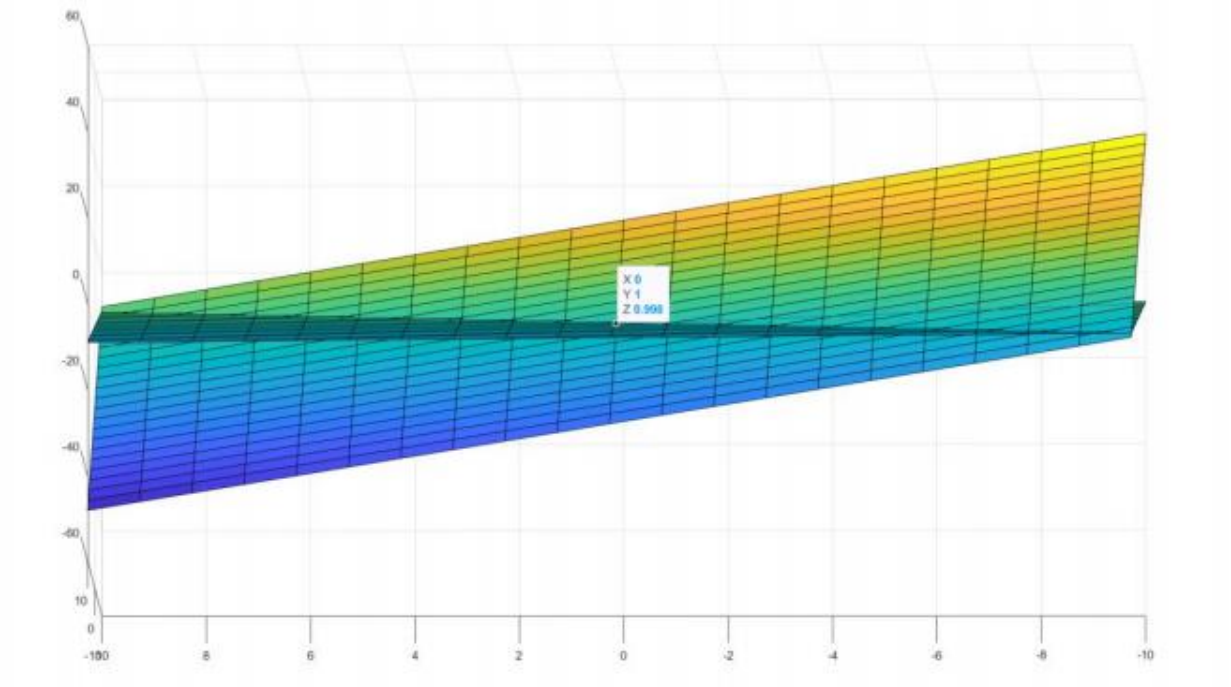
$$0{,}098x_1 + 1{,}002x_2 + x_3 = 2$$
$$0 - 17{,}47x_2 + 21{,}43 = 38{,}86$$
$$0 \quad 0 \quad 2{,}11x_3 = K - 1{,}88$$

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
```


X 0
Y 1
Z 0.998
60
40
20
0
-20
-40
-60
10
0
-10
8
6
4
2
0
-2
-4
-6
-8
-10

Matriz Inversa

$$A = \begin{pmatrix} 0,098 & 1,002 & 1 \\ 2,002 & 3,001 & -1,001 \\ 3,002 & 4 & 0 \end{pmatrix} \Rightarrow A^{-1} \begin{pmatrix} -1,1062 & -1,1051 & -1,1062 \\ 0,8302 & 0,8294 & -0,5802 \\ 0,2765 & -0,7227 & 0,4730 \end{pmatrix}$$

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

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

$x_2 = -1,455$

$x_1 = 4,6805$

LU

Extraigo la matriz de gauss

$$U = \begin{pmatrix} 0,098 & 1,002 & 1 & 2 \\ 0 & -17,96 & -21,42 & -38,8571 \\ 0 & 0 & 2,1149 & K-1 \end{pmatrix}$$

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

Si $x_3 = 0$

$K = 1,8868$

$x_2 = 2,2214$

$x_1 = -2,3354$

Sistema

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

diary off