Sustitución hacia atrás

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A =   b =
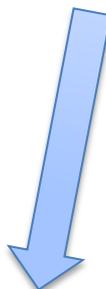
    16.0000   12.0000   19.0000   19.0000   4.0000
          0   -12.5000   -2.3750   -12.3750   4.5000
          0   0   -0.0400   10.1600   7.7600
          0   0   0 -450.2500   -328.5000

x_1
x_2
x_3
x_4

    16.0000   12.0000   19.0000   19.0000   4.0000
          0   -12.5000   -2.3750   -12.3750   4.5000
          0   0   -0.0400   10.1600   7.7600
          0   0   0 -450.2500   -328.5000

Sustitución hacia atrás

$$x_1$$
$$x_2$$
$$x_3$$
$$x_4$$

16.0000	12.0000	19.0000	19.0000	4.0000
0	−12.5000	−2.3750	−12.3750	4.5000
0	0	−0.0400	10.1600	7.7600
0	0	0	−450.2500	−328.5000

$$A_{1,1}x_1 + A_{1,2}x_2 + A_{1,3}x_3 + A_{1,4}x_4 = b_1$$

$$A_{2,2}x_2 + A_{2,3}x_3 + A_{2,4}x_4 = b_2$$

$$A_{3,3}x_3 + A_{3,4}x_4 = b_3$$

$$A_{4,4}x_4 = b_4$$

$$A_{1,1}x_1 + A_{1,2}x_2 + A_{1,3}x_3 + A_{1,4}x_4 = b_1$$

$$A_{2,2}x_2 + A_{2,3}x_3 + A_{2,4}x_4 = b_2$$

$$A_{3,3}x_3 + A_{3,4}x_4 = b_3$$

$$A_{4,4}x_4 = b_4$$

$$x_4 = \frac{b_4}{A_{4,4}}$$

$$x_2 = \frac{b_2 - (A_{2,3}x_3 + A_{2,4}x_4)}{A_{2,2}}$$
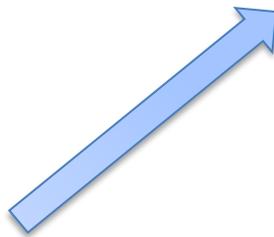
$$x_3 = \frac{b_3 - A_{3,4}x_4}{A_{3,3}}$$

$$x_1 = \frac{b_1 - (A_{1,2}x_2 + A_{1,3}x_3 + A_{1,4}x_4)}{A_{1,1}}$$

$$x_4 = \frac{b_4}{A_{4,4}}$$

$$x_3 = \frac{b_3 - A_{3,4}x_4}{A_{3,3}}$$

$$x_2 = \frac{b_2 - (A_{2,3}x_3 + A_{2,4}x_4)}{A_{2,2}}$$

$$x_1 = \frac{b_1 - (A_{1,2}x_2 + A_{1,3}x_3 + A_{1,4}x_4)}{A_{1,1}}$$

$$x_3 = \frac{b_3 - \boxed{A_{3,4} x_4}}{A_{3,3}}$$

A(3,4)*x(4,1)

$$
\begin{array}{cccc|c}
 & & & & x_1 \\
 & & & & x_2 \\
 & & & & x_3 \\
 & & & & \boxed{x_4} \\
\hline
A_{1,1} & A_{1,2} & A_{1,3} & A_{1,4} & \\
0 & A_{2,2} & A_{2,3} & A_{2,4} & \\
0 & 0 & A_{3,3} & \boxed{A_{3,4}} & A_{3,4} x_4 \\
0 & 0 & 0 & A_{4,4} & \\
\end{array}
$$

$$x_2 = \frac{b_2 - \boxed{(A_{2,3}x_3 + A_{2,4}x_4)}}{A_{2,2}}$$

A(2,3:4)*x(3:4,1)

$$x_1$$

$$x_2$$

$$\boxed{\begin{array}{c} x_3 \\ x_4 \end{array}}$$

$$
\begin{array}{cccc|l}
A_{1,1} & A_{1,2} & A_{1,3} & A_{1,4} & \\
0 & A_{2,2} & \boxed{A_{2,3} \quad A_{2,4}} & & A_{2,3}x_3 + A_{2,4}x_4 \\
0 & 0 & A_{3,3} & A_{3,4} & A_{3,4}x_4 \\
0 & 0 & 0 & A_{4,4} &
\end{array}
$$

$$x_1 = \frac{b_1 - \left(A_{1,2}x_2 + A_{1,3}x_3 + A_{1,4}x_4\right)}{A_{1,1}}$$

x_1

x_2

x_3

x_4

A(1,2:4)*x(2:4,1)

$A_{1,1}$	$A_{1,2}$	$A_{1,3}$	$A_{1,4}$	$A_{1,2}x_2 + A_{1,3}x_3 + A_{1,4}x_4$
0	$A_{2,2}$	$A_{2,3}$	$A_{2,4}$	$A_{2,3}x_3 + A_{2,4}x_4$
0	0	$A_{3,3}$	$A_{3,4}$	$A_{3,4}x_4$
0	0	0	$A_{4,4}$	

$$x_4 = \frac{b_4}{A_{4,4}}$$

$$x_3 = \frac{b_3 - A_{3,4}x_4}{A_{3,3}}$$

$$x_2 = \frac{b_2 - (A_{2,3}x_3 + A_{2,4}x_4)}{A_{2,2}}$$

$$x_1 = \frac{b_1 - (A_{1,2}x_2 + A_{1,3}x_3 + A_{1,4}x_4)}{A_{1,1}}$$

$$x_1$$

$$\boxed{\begin{array}{c} x_2 \\ x_3 \\ x_4 \end{array}}$$
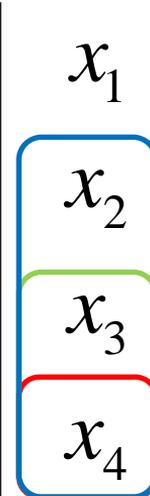
$A_{1,1}$	$A_{1,2}$	$A_{1,3}$	$A_{1,4}$	$A_{1,2}x_2 + A_{1,3}x_3 + A_{1,4}x_4$
0	$A_{2,2}$	$A_{2,3}$	$A_{2,4}$	$A_{2,3}x_3 + A_{2,4}x_4$
0	0	$A_{3,3}$	$A_{3,4}$	$A_{3,4}x_4$
0	0	0	$A_{4,4}$	

$$x_4 = \frac{b_4}{A_{4,4}}$$

x(4,1)=b(4)/A(4,4)

$$x_3 = \frac{b_3 - A_{3,4}x_4}{A_{3,3}}$$

x(3,1)=(b(3)-A(3,4)*x(4,1))/A(3,3)

$$x_2 = \frac{b_2 - (A_{2,3}x_3 + A_{2,4}x_4)}{A_{2,2}}$$

x(2,1)=(b(2)-A(2,3:4)*x(3:4,1))/A(2,2)

$$x_1 = \frac{b_1 - (A_{1,2}x_2 + A_{1,3}x_3 + A_{1,4}x_4)}{A_{1,1}}$$

x(1,1)=(b(1)-A(1,2:4)*x(2:4,1))/A(1,1)

```
x(4,1)=b(4)/A(4,4)
x(3,1)=(b(3)-A(3,4)*x(4,1))/A(3,3)
x(2,1)=(b(2)-A(2,3:4)*x(3:4,1))/A(2,2)
x(1,1)=(b(1)-A(1,2:4)*x(2:4,1))/A(1,1)


x(4,1)=b(4)/A(4,4)
for i=
x(i,1)=(b(i)-A(i,i+1:4)*x(i+1:4,1))/A(i,i)
end
```

```
x(4,1)=b(4)/A(4,4)
for i=3:-1:1
x(i,1)=(b(i)-A(i,i+1:4)*x(i+1:4,1))/A(i,i)
end


x(n,1)=b(n)/A(n,n)
for i=n-1:-1:1
x(i,1)=(b(i)-A(i,i+1:n)*x(i+1:n,1))/A(i,i)
end
```

```
--> [A b]=gaussiana(A,b)
 b  =

   59.
  -65.342105
   756.72414
   49.444444

 A  =

   38.     26.        23.          67.
   0.      3.0526316  18.815789  -108.71053
   0.      0.        -162.93103   1282.6897
   0.      0.         0.           82.759259


--> x = s_atras(A,b)
 x  =

   0.8005594
  -0.4926158
   0.0590289
   0.5974491
```

A = [38 26 23 67;73 53 63 20;26 54 76 39;50 12 5 83]
b = [59;48;22;84]
[A b]=gaussiana(A,b)
x = s_atras(A,b);

```
--> A  = [38 26 23 67;73 53 63 20;26 54 76 39;50 12 5 83];

--> b  = [59;48;22;84];

--> x=A\b
 x  =

   0.8005594
  -0.4926158
   0.0590289
   0.5974491
```