

# Practica 6

## Sistemas de ecuaciones

- Ejercicio1

```

                                METODO INVERSA
Datos:
A=      10.000   1.000   2.000
        4.000   6.000  -1.000
        -2.000   3.000   8.000

B=      3.000
        9.000
        51.000

A_inv=   0.097  -0.004  -0.025
        -0.057   0.159   0.034
        0.045  -0.061   0.106

Resultado:
x=      -1.000
        3.000
        5.000
>>
```

Código:

```
clc, clear all;
```

```
%Datos
```

```
A = [10,1,2;
```

```
     4,6,-1;
```

```
     -2,3,8];
```

```
B = [3;
```

```
     9;
```

```

51];

if(det(A)==0)
    fprintf("No tiene solucion")
    return;
end
A_inv = inv(A);
x = A_inv*B;
fprintf("\t\tMETODO INVERSA\n")
fprintf("Datos:\n")
for(i = 1:size(A,1))
    if(floor(size(A,1)/2)==i)
        fprintf("A= ")
        fprintf("\t%3.3f",A(i,:))
    else
        fprintf("\t%3.3f",A(i,:))
    end
    fprintf("\n")
end
fprintf("\n")
for(i = 1:size(B,1))
    if(floor(size(B,1)/2)==i)
        fprintf("B= ")
        fprintf("\t%3.3f",B(i,:))
    else
        fprintf("\t%3.3f",B(i,:))
    end
    fprintf("\n")
end

```

```

fprintf("\n")
for(i = 1:size(A_inv,1))
    if(floor(size(A_inv,1)/2)==i)
        fprintf("A_inv=")
        fprintf("\t%3.3f",A_inv(i,:))
    else
        fprintf("\t%3.3f",A_inv(i,:))
    end
    fprintf("\n")
end
fprintf("\n")

```

```

fprintf("Resultado:\n")
for(i = 1:size(x,1))
    if(floor(size(x,1)/2)==i)
        fprintf("x=")
        fprintf("\t%3.3f",x(i,:))
    else
        fprintf("\t%3.3f",x(i,:))
    end
    fprintf("\n")
end

```

end

- Ejercicio 2

```

El sistema no tiene una única solución .
>>

```

Código:

```

clc, clear all;

```

```

%Datos

```

```

A=[-3,5,2;
    -1,-2,3;
    9,-15,-6];
B=[7;
    -4;
    0];
if(det(A)==0)
    fprintf("El sistema no tiene una única solución .\n")
    return;
end

```

```

AU = [A,B];

```

```

n = size(AU,1);

```

```

for(i = 1:n)
    AU(i,:)=(1/AU(i,i))*AU(i,:);
    for(j=1:n)
        if(j~=i)
            AU(j,:)= -AU(j,i)*AU(i,:)+AU(j,:);
        end
    end
end
end

```

```

x=AU(:,n+1);
fprintf("\t\tMETODO GAUSS JORDAN\n")
fprintf("Datos:\n")
for(i = 1:size(A,1))
    if(floor(size(A,1)/2)==i)

```

```

        fprintf("A= ")
        fprintf("\t%3.3f",A(i,:))
    else
        fprintf("\t%3.3f",A(i,:))
    end
    fprintf("\n")
end
fprintf("\n")
for(i = 1:size(B,1))
    if(floor(size(B,1)/2)==i)
        fprintf("B= ")
        fprintf("\t%3.3f",B(i,:))
    else
        fprintf("\t%3.3f",B(i,:))
    end
    fprintf("\n")
end
fprintf("\n")

fprintf("Resultado:\n")
for(i = 1:size(x,1))
    if(floor(size(x,1)/2)==i)
        fprintf("x=")
        fprintf("\t%3.3f",x(i,:))
    else
        fprintf("\t%3.3f",x(i,:))
    end
    fprintf("\n")
end
end

```

- Ejercicio 3

```

METODO GAUSS JORDAN
Datos:
A=      10.000  1.000  2.000  -1.000
      -5.000  4.000  6.000  -1.000
        0.000  -2.000  3.000  8.000
        0.000  0.000  -5.000  5.000

B=      -3.000
        9.000
        2.000
       -1.000

AU=      10.000  1.000  2.000  -1.000  -3.000
      -5.000  4.000  6.000  -1.000  9.000
        0.000  -2.000  3.000  8.000  2.000
        0.000  0.000  -5.000  5.000  -1.000
Resultado:
x=      -0.469
        0.982
        0.506
        0.306
>>

```

Código:

```
clc, clear all;
```

```
%Datos
```

```
A=[10,1,2,-1;
```

```
  -5,4,6,-1;
```

```
  0,-2,3,8;
```

```
  0,0,-5,5];
```

```
B=[-3;
```

```
  9;
```

```
  2;
```

```
  -1];
```

```
if(det(A)==0)
```

```
    fprintf("El sistema no tiene una única solución .\n")
```

```

        return;
end

AU = [A,B];

fprintf("\t\tMETODO GAUSS JORDAN\n")
fprintf("Datos:\n")
for(i = 1:size(A,1))
    if(floor(size(A,1)/2)==i)
        fprintf("A= ")
        fprintf("\t%3.3f",A(i,:))
    else
        fprintf("\t%3.3f",A(i,:))
    end
    fprintf("\n")
end
fprintf("\n")
for(i = 1:size(B,1))
    if(floor(size(B,1)/2)==i)
        fprintf("B= ")
        fprintf("\t%3.3f",B(i,:))
    else
        fprintf("\t%3.3f",B(i,:))
    end
    fprintf("\n")
end
fprintf("\n")
for(i = 1:size(AU,1))
    if(floor(size(AU,1)/2)==i)

```

```

        fprintf("AU=")
        fprintf("\t%3.3f",AU(i,:))
    else
        fprintf("\t%3.3f",AU(i,:))
    end
    fprintf("\n")
end

n = size(AU,1);

for(i = 1:n)
    AU(i,:)=(1/AU(i,i))*AU(i,:);
    for(j=1:n)
        if(j~=i)
            AU(j,:)= -AU(j,i)*AU(i,:)+AU(j,:);
        end
    end
end

end

x=AU(:,n+1);

fprintf("Resultado:\n")
for(i = 1:size(x,1))
    if(floor(size(x,1)/2)==i)
        fprintf("x=")
        fprintf("\t%3.3f",x(i,:))
    else
        fprintf("\t%3.3f",x(i,:))
    end
end

```



```
fprintf("\n")
```

```
end
```

- Ejercicio 4

```
METODO GAUSS JORDAN
Datos:
A=      1.000    2.000    0.000
      -2.000    3.000   -4.000
       3.000   -1.000    2.000

B=      3.000
       3.000
       3.000

AU=      1.000    2.000    0.000    3.000
      -2.000    3.000   -4.000    3.000
       3.000   -1.000    2.000    3.000

Resultado:
x=      2.143
       0.429
      -1.500
>>
```

Código:

```
clc, clear all;
```

```
%Datos
```

```
A=[1,2,0;
```

```
   -2,3,-4;
```

```
   3,-1,2];
```

```
B=[3;
```

```
   3;
```

```
   3];
```

```
if(det(A)==0)
```

```
    fprintf("El sistema no tiene una única solución .\n")
```

```
    return;
```

```
end
```

```
AU = [A,B];
```

```
fprintf("\t\tMETODO GAUSS JORDAN\n")
```

```
fprintf("Datos:\n")
```

```
for(i = 1:size(A,1))
```

```
    if(floor(size(A,1)/2)==i)
```

```
        fprintf("A=  ")
```

```
        fprintf("\t%3.3f",A(i,:))
```

```
    else
```

```
        fprintf("\t%3.3f",A(i,:))
```

```
    end
```

```
    fprintf("\n")
```

```
end
```

```
fprintf("\n")
```

```
for(i = 1:size(B,1))
```

```
    if(floor(size(B,1)/2)==i)
```

```
        fprintf("B=  ")
```

```
        fprintf("\t%3.3f",B(i,:))
```

```
    else
```

```
        fprintf("\t%3.3f",B(i,:))
```

```
    end
```

```
    fprintf("\n")
```

```
end
```

```
fprintf("\n")
```

```
for(i = 1:size(AU,1))
```

```
    if(floor(size(AU,1)/2)==i)
```

```
        fprintf("AU=")
```

```
        fprintf("\t%3.3f",AU(i,:))
```

```

else
    fprintf("\t%3.3f",AU(i,:))
end
fprintf("\n")
end

n = size(AU,1);

for(i = 1:n)
    AU(i,:)=(1/AU(i,i))*AU(i,:);
    for(j=1:n)
        if(j~=i)
            AU(j,:)= -AU(j,i)*AU(i,:)+AU(j,:);
        end
    end
end

end

x=AU(:,n+1);

fprintf("Resultado:\n")
for(i = 1:size(x,1))
    if(floor(size(x,1)/2)==i)
        fprintf("x=")
        fprintf("\t%3.3f",x(i,:))
    else
        fprintf("\t%3.3f",x(i,:))
    end
    fprintf("\n")
end
end

```

