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SE-Comps B/Batch C

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Scilab no.7 : Gauss Jordan Method

Program No.1 :- Write a scilab code to solve the following equations in terms of x,y,z by using gauss jordan method

$$x+3y+2z = 2$$

$$2x+7y+7z = -1$$

$$2x+5y+2z = 7$$

Code :-

```
clc;
clear all;
A = [1 3 2 ; 2 7 7 ; 2 5 2];
printf("Matrix A : ");
disp(A)
printf("Matrix B : ")
B = [2 ; -1 ; 7]
disp(B)
C = [A B]
printf("Matrix C : ")
disp(C)
n = 3
for i = 1:n
    if C(i,i)~=0
        C(i, :) = C(i, :)/C(i, i);
    end
    for j = 1:n-1
        if i+j < n+1
            C(i+j, :) = C(i+j, :) - C(i+j, i)*C(i, :);
        end
    end
end
disp(C)
end
for j = n:-1:2
    for i = 1 : j-1
        C(i, :) = C(i, :) - C(i, j)* C(j, :)
    end
end
```

```

    disp(C);
end
printf("\nx = %g\n",C(1,4));
printf("y = %g\n",C(2,4));
printf("z = %g\n",C(3,4));

```

Output :-

```

Scilab 6.1.1 Console
Matrix A :
    1.   3.   2.
    2.   7.   7.
    2.   5.   2.
Matrix B :
    2.
   -1.
    7.
Matrix C :
    1.   3.   2.   2.
    2.   7.   7.  -1.
    2.   5.   2.   7.

    1.   3.   2.   2.
    0.   1.   3.  -5.
    0.  -1.  -2.   3.

    1.   3.   2.   2.
    0.   1.   3.  -5.
    0.   0.   1.  -2.

    1.   3.   2.   2.
    0.   1.   3.  -5.
    0.   0.   1.  -2.

    1.   3.   0.   6.
    0.   1.   0.   1.
    0.   0.   1.  -2.

    1.   0.   0.   3.
    0.   1.   0.   1.
    0.   0.   1.  -2.

x = 3
y = 1
z = -2
--> |

```

Program No. 2:- Write a scilab code to solve the following equations in terms of x,y,z,w by using gauss jordan method

$$8x+9y+2z+9w = 42$$

$$2x+7y+3z+5w = 45$$

$$4x+3y+6z+6w = 53$$

$$2x+5y+6z+8w = 63$$

Code:-

```
clc;
clear all;
A = [8 9 2 9 ; 2 7 3 5 ; 4 3 6 6 ; 2 5 6 8];
printf("Matrix A : ");
disp(A)
printf("Matrix B : ")
B = [42;45;53;63];
disp(B)
C = [A B]
printf("Matrix C : ")
disp(C)
n = 4
for i = 1:n
    if C(i,i)~=0
        C(i, :) = C(i, :)/C(i, i);
    end
    for j = 1:n-1
        if i+j < n+1
            C(i+j, :) = C(i+j, :) - C(i+j, i)*C(i, :);
        end
    end
    disp(C)
end
for j = n:-1:2
    for i = 1:j-1
        C(i, :) = C(i, :) - C(i, j)* C(j, :)
    end
    disp(C);
end
printf("\nx = %g\n",C(1,5));
printf("y = %g\n",C(2,5));
printf("z = %g\n",C(3,5));
printf("w = %g\n",C(4,5));
```

Output :-

```
Scilab 6.1.1 Console
Matrix A :
  8.  9.  2.  9.
  2.  7.  3.  5.
  4.  3.  6.  6.
  2.  5.  6.  8.
Matrix B :
 42.
 45.
 53.
 63.
Matrix C :
  8.  9.  2.  9.  42.
  2.  7.  3.  5.  45.
  4.  3.  6.  6.  53.
  2.  5.  6.  8.  63.

  1.  1.125  0.25  1.125  5.25
  0.  4.75  2.5  2.75  34.5
  0. -1.5  5.  1.5  32.
  0.  2.75  5.5  5.75  52.5

  1.  1.125  0.25  1.125  5.25
  0.  1.  0.5263158  0.5789474  7.2631579
  0.  0.  5.7894737  2.3684211  42.894737
  0.  0.  4.0526316  4.1578947  32.526316

  1.  1.125  0.25  1.125  5.25
  0.  1.  0.5263158  0.5789474  7.2631579
  0.  0.  1.  0.4090909  7.4090909
  0.  0.  0.  2.5  2.5

  1.  1.125  0.25  1.125  5.25
  0.  1.  0.5263158  0.5789474  7.2631579
  0.  0.  1.  0.4090909  7.4090909
  0.  0.  0.  1.  1.

  1.  1.125  0.25  0.  4.125
  0.  1.  0.5263158  0.  6.6842105
  0.  0.  1.  0.  7.
  0.  0.  0.  1.  1.

  1.  1.125  0.  0.  2.375
  0.  1.  0.  0.  3.
  0.  0.  1.  0.  7.
  0.  0.  0.  1.  1.

  1.  0.  0.  0.  -1.
  0.  1.  0.  0.  3.
  0.  0.  1.  0.  7.
  0.  0.  0.  1.  1.

x = -1
y = 3
z = 7
w = 1

-->
```

Program No. 3 :- Write a scilab code to solve the following equations in terms of x,y,z by using gauss jordan method

$$15x - y = 97$$

$$3x - 5y + z = 47$$

$$3x + 5y + 15z = 67$$

Code :-

```
clc;
clear all;
A = [15 -1 0 ; 3 -5 1 ; 3 5 15];
printf("Matrix A : ");
disp(A)
printf("Matrix B : ")
B = [97 ; 47 ; 67]
disp(B)
C = [A B]
printf("Matrix C : ")
disp(C)
n = 3
for i = 1:n
    if C(i,i)~=0
        C(i, :) = C(i, :)/C(i, i);
    end
    for j = 1:n-1
        if i+j < n+1
            C(i+j, :) = C(i+j, :) - C(i+j, i)*C(i, :);
        end
    end
    disp(C)
end
for j = n:-1:2
    for i = 1:j-1
        C(i, :) = C(i, :) - C(i, j)* C(j, :)
    end
    disp(C);
end
printf("\nx = %g\n",C(1,4));
printf("y = %g\n",C(2,4));
printf("z = %g\n",C(3,4));
```

Output :-

Scilab 6.1.1 Console

Matrix A :

```
15. -1.  0.
 3. -5.  1.
 3.  5. 15.
```

Matrix B :

```
97.
47.
67.
```

Matrix C :

```
15. -1.  0.  97.
 3. -5.  1.  47.
 3.  5. 15.  67.
```

```
1. -0.0666667  0.  6.4666667
0. -4.8        1.  27.6
0.  5.2        15. 47.6
```

```
1. -0.0666667  0.  6.4666667
0.  1.         -0.2083333 -5.75
0.  0.         16.083333 77.5
```

```
1. -0.0666667  0.  6.4666667
0.  1.         -0.2083333 -5.75
0.  0.         1.  4.8186528
```

```
1. -0.0666667  0.  6.4666667
0.  1.         0. -4.746114
0.  0.         1.  4.8186528
```

```
1.  0.  0.  6.1502591
0.  1.  0. -4.746114
0.  0.  1.  4.8186528
```

x = 6.15026

y = -4.74611

z = 4.81865

-->

Program no. 4 :- Write a scilab code to solve the following equations in terms of x,y,z by using gauss jordan method

$$x+2y+6z = 22$$

$$3x+4y+z = 26$$

$$6x-y-z = 19$$

Code :-

```
clc;
clear all;
A = [1 2 6; 3 4 1; 6 -1 -1];
printf("Matrix A : ");
disp(A)
printf("Matrix B : ")
B = [22; 26; 19]
disp(B)
C = [A B]
printf("Matrix C : ")
disp(C)
n = 3
for i = 1:n
    if C(i,i)~=0
        C(i, :) = C(i, :)/C(i, i);
    end
    for j = 1:n-1
        if i+j < n+1
            C(i+j, :) = C(i+j, :) - C(i+j, i)*C(i, :);
        end
    end
    disp(C)
end
for j = n:-1:2
    for i = 1:j-1
        C(i, :) = C(i, :) - C(i, j)* C(j, :)
    end
    disp(C);
end
printf("\nx = %g\n",C(1,4));
printf("y = %g\n",C(2,4));
printf("z = %g\n",C(3,4));
```

Output :-

Scilab 6.1.1 Console

Matrix A :

```
1.  2.  6.
3.  4.  1.
6. -1. -1.
```

Matrix B :

```
22.
26.
19.
```

Matrix C :

```
1.  2.  6.  22.
3.  4.  1.  26.
6. -1. -1.  19.
```

```
1.  2.  6.  22.
0. -2. -17. -40.
0. -13. -37. -113.
```

```
1.  2.  6.  22.
0.  1.  8.5  20.
0.  0.  73.5 147.
```

```
1.  2.  6.  22.
0.  1.  8.5  20.
0.  0.  1.   2.
```

```
1.  2.  0.  10.
0.  1.  0.   3.
0.  0.  1.   2.
```

```
1.  0.  0.  4.
0.  1.  0.  3.
0.  0.  1.  2.
```

x = 4

y = 3

z = 2

-->

Program No. 5 :- Write a scilab code to solve the following equations in terms of x,y,z by using gauss jordan method

$$x+2y+6z = 44$$

$$3x+4y+z = 52$$

$$6x-y-z = 38$$

Code :-

```
clc;
clear all;
A = [1 2 6; 3 4 1; 6 -1 -1];
printf("Matrix A : ");
disp(A)
printf("Matrix B : ")
B = [44; 52; 38]
disp(B)
C = [A B]
printf("Matrix C : ")
disp(C)
n = 3
for i = 1:n
    if C(i,i)~=0
        C(i, :) = C(i, :)/C(i, i);
    end
    for j = 1:n-1
        if i+j < n+1
            C(i+j, :) = C(i+j, :) - C(i+j, i)*C(i, :);
        end
    end
    disp(C)
end
for j = n:-1:2
    for i = 1:j-1
        C(i, :) = C(i, :) - C(i, j)* C(j, :)
    end
    disp(C);
end
printf("\nx = %g\n",C(1,4));
printf("y = %g\n",C(2,4));
printf("z = %g\n",C(3,4));
```

Output :-

Scilab 6.1.1 Console

Matrix A :

```
1.  2.  6.
3.  4.  1.
6. -1. -1.
```

Matrix B :

```
44.
52.
38.
```

Matrix C :

```
1.  2.  6.  44.
3.  4.  1.  52.
6. -1. -1.  38.
```

```
1.  2.  6.  44.
0. -2. -17. -80.
0. -13. -37. -226.
```

```
1.  2.  6.  44.
0.  1.  8.5  40.
0.  0.  73.5 294.
```

```
1.  2.  6.  44.
0.  1.  8.5  40.
0.  0.  1.   4.
```

```
1.  2.  0.  20.
0.  1.  0.   6.
0.  0.  1.   4.
```

```
1.  0.  0.   8.
0.  1.  0.   6.
0.  0.  1.   4.
```

x = 8

y = 6

z = 4

--> |

Program No. 6 :- Write a scilab code to solve the following equations in terms of x,y,z by using gauss jordan method

$$2x+y-z+3w = 11$$

$$x-2y+z+w = 8$$

$$4x+7y+2z-w = 0$$

$$3x+5y+4z+4w = 17$$

Code :-

```
clc;
clear all;
A = [2 1 -1 3; 1 -2 1 1; 4 7 2 -1; 3 5 4 4]
printf("Matrix A : ");
disp(A)
printf("Matrix B : ")
B = [11; 8; 0; 17]
disp(B)
C = [A B]
printf("Matrix C : ")
disp(C)
n = 4
for i = 1:n
    if C(i,i)~=0
        C(i, :) = C(i, :)/C(i, i);
    end
    for j = 1:n-1
        if i+j < n+1
            C(i+j, :) = C(i+j, :) - C(i+j, i)*C(i, :);
        end
    end
    disp(C)
end
for j = n:-1:2
    for i = 1 : j-1
        C(i, :) = C(i, :) - C(i, j)* C(j, :)
    end
    disp(C);
end
printf("\nx = %g\n",C(1,5));
printf("y = %g\n",C(2,5));
printf("z = %g\n",C(3,5));
printf("w = %g\n",C(4,5));
```

Output :-

Scilab 6.1.1 Console

Matrix A :

```
2.  1. -1.  3.
1. -2.  1.  1.
4.  7.  2. -1.
3.  5.  4.  4.
```

Matrix B :

```
11.
8.
0.
17.
```

Matrix C :

```
2.  1. -1.  3.  11.
1. -2.  1.  1.  8.
4.  7.  2. -1.  0.
3.  5.  4.  4.  17.
```

```
1.  0.5 -0.5  1.5  5.5
0. -2.5  1.5 -0.5  2.5
0.  5.  4. -7. -22.
0.  3.5  5.5 -0.5  0.5
```

```
1.  0.5 -0.5  1.5  5.5
0.  1. -0.6  0.2 -1.
0.  0.  7. -8. -17.
0.  0.  7.6 -1.2  4.
```

```
1.  0.5 -0.5  1.5      5.5
0.  1. -0.6  0.2      -1.
0.  0.  1. -1.1428571 -2.4285714
0.  0.  0.  7.4857143  22.457143
```

```
1.  0.5 -0.5  1.5      5.5
0.  1. -0.6  0.2      -1.
0.  0.  1. -1.1428571 -2.4285714
0.  0.  0.  1.        3.
```

```
1.  0.5 -0.5  0.  1.
0.  1. -0.6  0. -1.6
0.  0.  1.  0.  1.
0.  0.  0.  1.  3.
```

```
1.  0.5  0.  0.  1.5
0.  1.  0.  0. -1.
0.  0.  1.  0.  1.
0.  0.  0.  1.  3.
```

```
1.  0.  0.  0.  2.
0.  1.  0.  0. -1.
0.  0.  1.  0.  1.
0.  0.  0.  1.  3.
```

x = 2

y = -1

z = 1

w = 3

--> |

Program No. 7 :- Write a scilab code to solve the following equations in terms of x,y,z,w by using gauss jordan method

$$2x+4y-z = 3$$

$$5x-7y+2z = 5$$

$$7x+8y-13z = 17$$

Code :-

```
clc;
clear all;
A = [2 4 -1 ; 5 -7 2 ; 7 8 -13];
printf("Matrix A : ");
disp(A)
printf("Matrix B : ")
B = [3 ; 5 ; 17]
disp(B)
C = [A B]
printf("Matrix C : ")
disp(C)
n = 3
for i = 1:n
    if C(i,i)~=0
        C(i , :) = C(i , :)/C(i , i);
    end
    for j = 1:n-1
        if i+j < n+1
            C(i+j , :) = C(i+j , :) - C(i+j , i)*C(i , :);
        end
    end
    disp(C)
end
for j = n:-1:2
    for i = 1 : j-1
        C(i , :) = C(i , :) - C(i , j)* C(j , :)
    end
    disp(C);
end
printf("\nx = %g\n",C(1,4));
printf("y = %g\n",C(2,4));
printf("z = %g\n",C(3,4));
```

Output :-

Scilab 6.1.1 Console

Matrix A :

```
2.  4. -1.
5. -7.  2.
7.  8. -13.
```

Matrix B :

```
3.
5.
17.
```

Matrix C :

```
2.  4. -1.  3.
5. -7.  2.  5.
7.  8. -13. 17.
```

```
1.  2. -0.5  1.5
0. -17.  4.5 -2.5
0. -6. -9.5  6.5
```

```
1.  2. -0.5  1.5
0.  1. -0.2647059  0.1470588
0.  0. -11.088235  7.3823529
```

```
1.  2. -0.5  1.5
0.  1. -0.2647059  0.1470588
0.  0.  1. -0.6657825
```

```
1.  2.  0.  1.1671088
0.  1.  0. -0.0291777
0.  0.  1. -0.6657825
```

```
1.  0.  0.  1.2254642
0.  1.  0. -0.0291777
0.  0.  1. -0.6657825
```

x = 1.22546

y = -0.0291777

z = -0.665782

-->