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SE-Comps B/Batch C

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LA ISE-2

Program No.1 :- Solve the given system of equations in terms of x,y,z,w using Gauss Jacobi Method. Perform 11 iterations.

$$-14x+4y+2z+5w=33$$

$$5x+20y+4z+9w=57$$

$$2x+5y+12z+w=92$$

$$3x+2y+2z-8w=60$$

Code :-

```
clc;
A = [-14 2 4 5;5 20 4 9;2 5 12 1;3 2 2 -8]
B = [33;57;92;60]
x = 0
y = 0
z = 0
w = 0
n = 11
for i = 1:n
    printf("\nFor iteration %d\n",i)
    X = (B(1) - y*A(1,2) - z*A(1,3) - w*A(1,4))/A(1,1)
    Y = (B(2) - x*A(2,1) - z*A(2,3) - w*A(2,4))/A(2,2)
    Z = (B(3) - x*A(3,1) - y*A(3,2) - w*A(3,4))/A(3,3)
    W = (B(4) - x*A(4,1) - y*A(4,2) - z*A(4,3))/A(4,4)
    printf("X = %g\n",X)
    printf("Y = %g\n",Y)
    printf("Z = %g\n",Z)
    printf("W = %g\n",W)
    x = X
    y = Y
    z = Z
    w = W
end
```

Output :-

Scilab 6.1.1 Console

```
For iteration 1
X = -2.35714
Y = 2.85
Z = 7.66667
W = -7.5
```

```
For iteration 2
X = -2.4381
Y = 5.28095
Z = 7.49702
W = -5.75476
```

```
For iteration 3
X = -1.51599
Y = 4.54976
Z = 6.35218
W = -5.21979
```

```
For iteration 4
X = -1.75648
Y = 4.30747
Z = 6.45858
W = -5.34301
```

```
For iteration 5
X = -1.8047
Y = 4.40176
Z = 6.60989
W = -5.46717
```

```
For iteration 6
X = -1.79234
Y = 4.43942
Z = 6.58898
W = -5.42385
```

```
For iteration 7
X = -1.77746
Y = 4.42102
Z = 6.56762
W = -5.41503
```

```
For iteration 8
X = -1.78304
Y = 4.4176
Z = 6.57207
W = -5.41939
```

```
For iteration 9
X = -1.78382
Y = 4.42007
Z = 6.57479
W = -5.42122
```

```
For iteration 10
X = -1.78334
Y = 4.42055
Z = 6.57404
W = -5.42022
```

```
For iteration 11
X = -1.78313
Y = 4.42013
Z = 6.57368
W = -5.42011
```

-->

Program No. 2:- Solve the given system of equations in terms of x,y,z,w using Gauss Jordan Method.

$$x+2y+3z-w=10$$

$$2x+3y-3z-w=1$$

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

$$2x-y+2z+3w=7$$

Code:-

```
clc;
a = [1 2 3 -1;2 3 -3 -1;3 2 -4 3;2 -1 2 3]
printf("The matrix A is: ")
disp(a)
b = [10;1;2;7]
printf("The matrix B is: ")
disp(b)
c = [a b]
printf("The augmented matrix is: ")
disp(c)
n = 4
for i = 1:n
    if c(i,i)==0
        c(i,:) = c(i,:)
    else
        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,:)
        else
            end
        end
    end
end
printf("The row echelon form is: ")
disp(c)
for j = n:-1:2
    for i = 1:i-1
        c(i,:) = c(i,:) - c(i,j)*c(j,:)
    end
end
printf("The reduced row echelon form is: ")
disp(c)
printf("X = %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
The matrix A is:
  1.  2.  3. -1.
  2.  3. -3. -1.
  3.  2. -4.  3.
  2. -1.  2.  3.
The matrix B is:
 10.
  1.
  2.
  7.
The augmented matrix is:
  1.  2.  3. -1. 10.
  2.  3. -3. -1.  1.
  3.  2. -4.  3.  2.
  2. -1.  2.  3.  7.
The row echelon form is:
  1.  2.  3. -1.      10.
  0.  1.  9. -1.      19.
  0.  0.  1.  0.0869565 2.0869565
  0.  0.  0.  1.      1.
The reduced row echelon form is:
  1.  0.  0.  0.  1.
  0.  1.  0.  0.  2.
  0.  0.  1.  0.  2.
  0.  0.  0.  1.  1.
X = 1
Y = 2
Z = 2
W = 1
--> |
```