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Computer Engineering Department & Information Technology Engineering Department

Academic Year: 2021-2022

Class: S.Y.B.Tech **Sem.:** 4 **Course:** Linear Algebra

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Experiment No.	5		

AIM:	To implement the Gauss Jacobi's method in Scilab
PROBLEMS	
CODE:	printf("\n") A=input("Enter the coefficents: ") b=input("Enter the right-hand side C: ") C=[A b] function display(x, y, z, tempx, tempy, tempz) printf(" Var\t| Initial\t| After\t|") printf("\n----------") printf("\n X\t| %f\t| %f\t|",x,tempx) printf("\n Y\t| %f\t| %f\t|",y,tempy) printf("\n Z\t| %f\t| %f\t|",z,tempz) endfunction function [x, y, z]=solve(matrix) x=0 y=0 z=0 limit=0.000001 steps=100 for i=1:steps tempx=(C(1,4)-C(1,2)*y-C(1,3)*z)/C(1,1) tempy=(C(2,4)-C(2,1)*x-C(2,3)*z)/C(2,2)

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```
        tempz=(C(3,4)-C(3,1)*x-C(3,2)*y)/C(3,3)

        diffX=tempx-x;
        diffY=tempy-y;
        diffZ=tempz-z;

        if (abs(diffX)<=limit && abs(diffY)<=limit &&
abs(diffZ)<=limit)
            break
        end
        printf("\n\n-->Step %d\n",i)
        display(x,y,z,tempx,tempy,tempz)
        x=tempx;
        y=tempy;
        z=tempz;
    end

endfunction

[x,y,z]=solve(C)
printf("\n\nFinal result:\n\n  X=> %f Y=> %f Z=>
%f\n",x,y,z)
```

OUTPUT TABLE:

```
Enter the coefficents: [20,1,-2; 3,20,-1; 2,-3,20]

Enter the right-hand side C: [17;-18;25]



-->Step 1
 Var   |  Initial      |  After        |
-----------------------------------------
   X   |  0.000000     |  0.850000     |
   Y   |  0.000000     |  -0.900000    |
   Z   |  0.000000     |  1.250000     |

-->Step 2
 Var   |  Initial      |  After        |
-----------------------------------------
   X   |  0.850000     |  1.020000     |
   Y   |  -0.900000    |  -0.965000    |
   Z   |  1.250000     |  1.030000     |
```

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-->Step 3

Var	Initial	After
X	1.020000	1.001250
Y	-0.965000	-1.001500
Z	1.030000	1.003250

-->Step 4

Var	Initial	After
X	1.001250	1.000400
Y	-1.001500	-1.000025
Z	1.003250	0.999650

-->Step 5

Var	Initial	After
X	1.000400	0.999966
Y	-1.000025	-1.000078
Z	0.999650	0.999956

-->Step 6

Var	Initial	After
X	0.999966	1.000000
Y	-1.000078	-0.999997
Z	0.999956	0.999992

-->Step 7

Var	Initial	After
X	1.000000	0.999999
Y	-0.999997	-1.000000
Z	0.999992	1.000000

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```
-->Step 8
  Var   |  Initial      |  After        |
----------------------------------------
   X    |  0.999999     |  1.000000     |
   Y    |  -1.000000    |  -1.000000    |
   Z    |  1.000000     |  1.000000     |

Final result:

  X=> 1.000000 Y=> -1.000000 Z=> 1.000000
```

Max possible iteration is 100
Var limit is used for precision in answer

RESULT: Learnt about the Gauss Jacobi's method and implemented in Scilab code. Also implement the limit variable which decides the precision/accuracy of the result. Also learnt how to use the abs method and void functions to print variables.