



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.	3		

AIM:	To evaluate the consistency of a given system of equation
PROBLEM 1	
CODE:	<pre>For a 3x3 matrix A=[1,1,1; 1,2,3; 1,4,9] B=[3; 4; 6] C=[A B] if rank(C)==rank(A) then printf("The system is consistent\n") C(2,:)=C(2,:)-C(1,:) disp(C) C(3,:)=C(3,:)-C(1,:) disp(C) C(3,:)=C(3,:)-3*C(2,:) disp(C) printf("The rank of matrix A is %d and C is %d",rank(A),rank(C)) z=C(3,4)/C(3,3) y=(C(2,4)-z*C(2,3))/C(2,2) x=(C(1,4)-y*C(1,2)-z*C(1,3))/C(1,1)</pre>



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	<pre>printf("\nThe value of x,y,z is %d,%d,%d",x,y,z) else disp("The system is inconsitent") end</pre>
Output:	<pre>--> exec('C:\Users\Hp\OneDrive\Desktop\Linear Algebra\EXP 3\exp3.sce', -1) The system is consistent 1. 1. 1. 3. 0. 1. 2. 1. 1. 4. 9. 6. 1. 1. 1. 3. 0. 1. 2. 1. 0. 3. 8. 3. 1. 1. 1. 3. 0. 1. 2. 1. 0. 0. 2. 0. The rank of matrix A is 3 and C is 3 The value of x,y,z is 2,1,0</pre>

PROBLEM 2

CODE:	<pre>For general matrix A=input("Enter the coefficent C: ") b=input("Enter the right-hand side C: ") //[2,1,1; 1,1,1; 1,-1,2] //[5;4;1] [m,n]=size(A) [r,s]=size(b)</pre>
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	<pre>//error handling if m~=n then error("C A should be a square C") elseif m~=r error("A and b are of different dimension.") end printf("A: \n") disp(A) printf("B: \n") disp(b) C=[A b] printf("The augmented C is \n") disp(C) n=size(A,1); //consistency check if rank(A)==rank(C) then printf("The system of equation is consistent") for i=1:n if C(i,i)==0 printf("Swapping C rows\n") T=C(i,i) C(i,:)=C(modulo(i+1,n),:) C(modulo(i+1,n),:)=T disp(C) end if C(i,i)~=1 printf("\nDividing rows %d with %.2f",i,C(i,i)) C(i,:)=C(i,:)/C(i,i) end disp(C) for j=i+1:n C(j,:)=C(j,:)-C(j,i)*C(i,:) end end end</pre>
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	<pre>disp(C) end sol=[] for i=n:-1:1 sol(i)=C(i,n+1) for j=n:-1:i+1 sol(i)=double(sol(i))-double(C(i,j)*sol(j)) end end printf("Row reduced Echeon form is : \n") disp(C) printf("From Back Substitution: \n\n") printf("The solution for the system of equation is: \n") sol=[] for i=n:-1:1 sol(i)=C(i,n+1) for j=n:-1:i+1 sol(i)=double(sol(i))-double(C(i,j)*sol(j)) end end for i=1:n printf("X%d = %f\n",i,sol(i)) end else printf("The system of equations is inconsitent") end</pre>
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Output:

```
Enter the right-hand side C: [5;4;1]
```

```
A:
```

```
2.  1.  1.  
1.  1.  1.  
1. -1.  2.
```

```
B:
```

```
5.  
4.  
1.
```

```
The augmented C is
```

```
2.  1.  1.  5.  
1.  1.  1.  4.  
1. -1.  2.  1.
```

```
The system of equation is consistent
```

```
Dividing rows 1 with 2.00
```

```
1.  0.5  0.5  2.5  
1.  1.  1.  4.  
1. -1.  2.  1.
```

```
1.  0.5  0.5  2.5  
0.  0.5  0.5  1.5  
0. -1.5  1.5 -1.5
```

```
Dividing rows 2 with 0.50
```

```
1.  0.5  0.5  2.5  
0.  1.  1.  3.  
0. -1.5  1.5 -1.5
```

```
1.  0.5  0.5  2.5  
0.  1.  1.  3.  
0.  0.  3.  3.
```



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```
Dividing rows 3 with 3.00
```

```
1.  0.5  0.5  2.5
0.  1.   1.   3.
0.  0.   1.   1.
```

```
1.  0.5  0.5  2.5
0.  1.   1.   3.
0.  0.   1.   1.
```

```
Row reduced Echeon form is :
```

```
1.  0.5  0.5  2.5
0.  1.   1.   3.
0.  0.   1.   1.
```

```
Finding the Values by remultiplying :
```

```
The solution for the system of equation is:
```

```
X1 = 1.000000
```

```
X2 = 2.000000
```

```
X3 = 1.000000
```

RESULT: Learnt how to convert into row echelon form in scilab using for loops
Learnt how to find If a given system of equation is consistent or not.