EXPERIMENT 3

AIM

Write a program to check the consistency and inconsistency of a linear system of equations.

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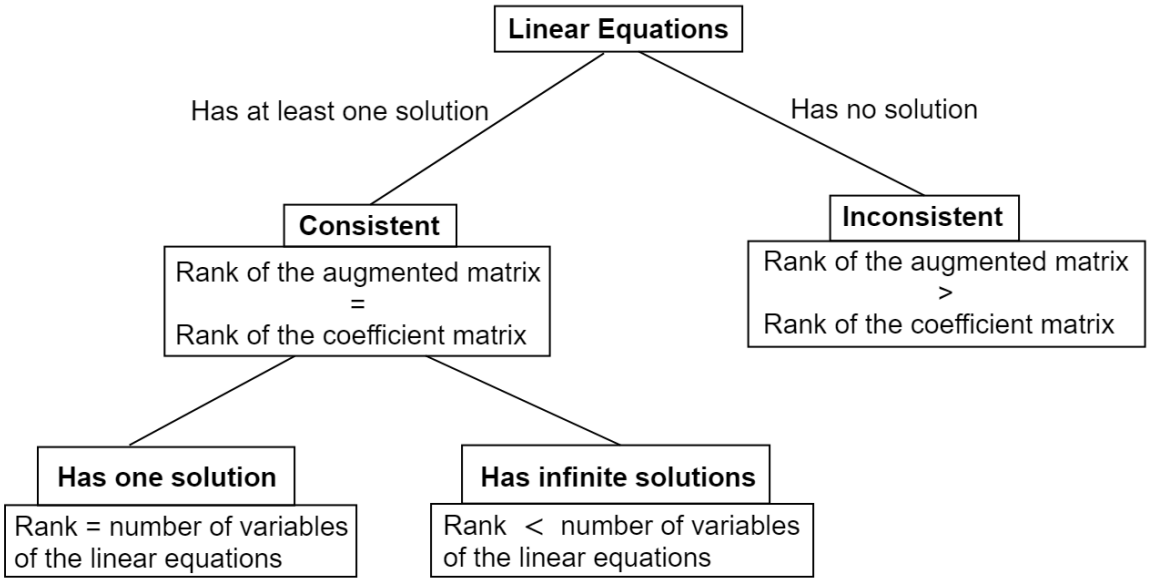
THEORY:



SOURCE CODE

```
clear all;
close all;


%Input the Coefficient Matrix
a = input("Enter the coefficient matrix A: ")


%Input the RHS Vector
d = input("Enter the RHS Vector B: ")


%Augment the matrices
ad=[a,d];
```

```
%finding ranks of the matrices
rank_a = rank(a);
rank_ad=rank(ad);


if rank_a == rank_ad && rank_a < size(a,1)
    disp("The system of Equations is CONSISTENT and DEPENDANT.");
elseif rank_a == rank_ad && rank_a == size(a,1)
   disp("The system of Equations is CONSISTENT and UNIQUE.");
elseif rank_a ~= rank_ad
    disp("THe system of equations is NOT CONSISTENT.")


end
```

OUTPUT:

1. Consistent and Dependant

```
Enter the coefficient matrix A:
[1,2,3;3,6,9;2,4,6]

a =

     1     2     3
     3     6     9
     2     4     6

Enter the RHS Vector B:
[1;3;2]

d =

     1
     3
     2

The system of Equations is CONSISTENT and DEPENDANT.
>>
```

2. Inconsistent

COMMAND WINDOW

```
>> consistency_of_sys_lin_equn
>> consistency_of_sys_lin_equn
Enter the coefficient matrix A:
[1,2,-1;2,-1,2;1,-3,3]

a =

     1     2    -1
     2    -1     2
     1    -3     3

Enter the RHS Vector B:
[3;5;6]

d =

     3
     5
     6

THe system of equations is NOT CONSISTENT.
>>
```

3. Consistent but not Dependant

```
>> consistency_of_sys_lin_equn
Enter the coefficient matrix A:
[1,1,1;0,2,-6;3,6,-5]

a =

     1     1     1
     0     2    -6
     3     6    -5

Enter the RHS Vector B:
[1;2;4]

d =

     1
     2
     4

The system of Equations is CONSISTENT and UNIQUE.
>>
```