**Experiment: 01 Date:23.02.2022**

**Title: Finding Determinant of a Square Matrix.**

**Program Name:**

1. **Write a MATLAB code for finding Determinant value of a matrix using Laplace expansion (use recursive function).**
2. **Check your program for the following example and compare the result with the value obtained by using “det” function in MATLAB.**

**A =**

**Algorithm:**

1. Start
2. Read the coefficients matrix
3. Find the order of
4. If number of row is equal to the number of column of , then

Goto step 6

1. Otherwish print an error , “”
2. Build a recursive function ‘determinant’

If , then calculate determinant by using the formula

Otherwish,

Initialize

For

Create a temporary copy of a and store in A\_temp

Delete first row and -th coloumn of A\_temp

Repeat

1. Determinant value is

**Program Code:**

1. **Program Code :(For Build a recursive function determinant (determinant.m )) :**

**function d = determinant(A)**

**[m,n] = size(A);**

**if n == 2**

**d=(( A(1,1)\*A(2,2)) - (A(1,2)\*A(2,1)));**

**else**

**d=0;**

**for j = 1:n**

**A\_temp = A;**

**A\_temp(1,:) =[];**

**A\_temp(:, j)=[];**

**d = (d+ ((-1)^(1+j))\*(A(1,j)\*determinant(A\_temp)));**

**end**

**end**

**end**

**Program Code :(Finding Determinant of a Square Matrix):**

**A= input('Enter the matrix : ');**

**[m,n] = size(A);**

**if ( m ~= n)**

**disp('Determinant does not exist....');**

**else**

**d= determinant(A);**

**fprintf('Determinant of the matrix is = %f ',d);**

**end**

**Output:**

**>> EXP\_1**

**Enter the matrix : [1 12 -1 4;0 -5 2 1;5 2 -1 0;2 0 4 3]**

**Determinant of the matrix is = -372.000000 >>**

1. **Program Code : (compare the result with the value obtained by using ‘det’ function)**

**A= input('Enter the matrix : ');**

**d1=det(A);**

**fprintf('Determinant of the matrix is = %f ',d1);**

**Output:**

**>> EXP\_\_1\_2**

**Enter the matrix : [1 12 -1 4;0 -5 2 1;5 2 -1 0;2 0 4 3]**

**Determinant of the matrix is = -372.000000 >>**

**Conclusion:**

**We saw that , the Determinant value of the given Square Matrix (4 x 4) using Laplace expansion (using a recursive function) and the value obtained by using ‘det’ function are same that is,**

**-372.000000.**