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| **Name** | Manish Shashikant Jadhav |
| **UID** | 2023301005 |
| **Subject** | Linear Algebra |
| **Experiment No.** | 1 |
| **Aim** | Implementation of Basic Commands and Operations on Matrix |
| **Code** | 1. **Basic Scilab Commands:**   clc;  printf("Display identity matrix of order 3:");  disp(eye(3,3));  printf("Display matrix with all elements ONE of order 3:");  disp(ones(3,3));  printf("Display given matrix A:");  A=[1 2 3;4 5 6;7 8 0]  disp(A);  printf("Display random matrix of order 3:");  disp(rand(3,3));  printf("Display lower triangular matrix from A:");  disp(tril(A));  printf("Display upper triangular matrix from A:");  disp(triu(A));  printf("Display transpose of A:")  disp(A');  printf("Display size of matrix A:");  disp(size(A));  printf("Display A33 element of A:");  disp(A(3,3));  printf("Display 2nd column of A:");  disp(A(:,2));  printf("Display 3rd row of A:");  disp(A(3,:));  printf("Display sum of all elements of A:");  disp(sum(A));  printf("Display product of all elements of A:");  disp(prod(A));  printf("Display sum of elements of 2nd column in matrix A:");  disp(sum(A(:,2)));  printf("Display product of elements of 2nd column in matrix A:");  disp(prod(A(:,2)));  printf("Display sum of elements of 3rd row in matrix A:");  disp(sum(A(3,:)));  printf("Display product of elements of 3rd row in matrix A:");  disp(prod(A(3,:)));  printf("Display sum of all columns in order in matrix A:");  disp(sum(A,'r'));  printf("Display product of all columns in order in matrix A:");  disp(prod(A,'r'));  printf("Display sum of all rows in order in matrix A:");  disp(sum(A,'c'));  printf("Display product of all rows in order in matrix A:");  disp(prod(A,'c'));  printf("Display imaginary part of matrix A:");  disp(imag(A));  printf("Display real part of matrix A:");  disp(real(A));  printf("Display inverse of matrix A:");  disp(inv(A));  printf("Display determinant of matrix A:");  disp(det(A));  printf("Display trace of matrix A:");  disp(trace(A));  printf("Display rank of matrix A:");  disp(rank(A));  printf("Display diagonal matrix A:");  disp(eye(3,3).\*A);  printf("Display only diagonal elements of matrix A:");  disp(diag(A));  printf("Display conjugate of matrix A:");  disp(conj(A));     1. **Exercise:**   C=rand(4,4);  printf("The random generated matrix C is: ");  disp(C);  sum\_first\_column = sum(C(:,1));  printf("Sum of first column elements: ");  disp(sum\_first\_column);  product\_second\_row = prod(C(2,:));  printf("Product of second row elements: ");  disp(product\_second\_row);  sum\_matrix = sum(C);  printf("Sum of all elements: ");  disp(sum\_matrix);  determinant = det(C);  printf("Determinant of Matrix A: ");  disp(determinant);  trace\_matrix = trace(C);  printf("Trace of Matrix A: ");  disp(trace\_matrix);     1. **Code:**   A=[1 2+%i 4; 3-4\*%i 9 -2; 2 -5 1-%i]  disp(A);  printf("Display real part of matrix A:");  disp(real(A));  printf("Display imaginary part of matrix A:");  disp(imag(A));  printf("Display random matrix of order 3 with elements from 0 to 9:")  disp(rand(3,3)\*10);  printf("Display random matrix of order 3 with integer elements from 0 to 9:")  disp(int(rand(3,3)\*10));  B=[1 3 5; 2 4 1; 1 2 3]  printf("Display matrix B:")  disp(B);  printf("Display reduced row echelon form of B:");  disp(rref(B));  printf("Display multiplication of A & B: ");  disp(A\*B);  printf("Display reciprocal of elements in B: ")  disp(1./B);  printf("Display square root of 25:");  disp(sqrt(25));  printf("Display the sine of pi/2");  disp(sin(%pi/2));  printf("Display the given value of x:");  x= 3^2;  disp(x);  printf("Display reciprocal of given value");  disp(1/x);  **Output:** |
| **Conclusion** | Hence, by completing this experiment I came to know about Implementation of Basic Commands and Operations on Matrix. |