

## PRACTICAL No. 5

**AIM:-** Compute discrete cosine transform, Program to perform KL transform for the given 2D matrix.

**Code:-**

```
clear;
clc;
X=[4,3,5,6;4,2,7,7;5,5,6,7];
[m,n]=size(X);
A=[];
E=[];
for i=1:n
    A=A+X(:,i);
    E=E+X(:,i)*X(:,i)';
end
mx=A/n;
E=E/n;
C=E-mx*mx';
[V,D]=spec(C);
d=diag(D);
[d,i]=gsort(d);
for j=1:length(d)
    T(:,j)=V(:,i(j));
end
T=T'
disp(d,' Eigen Values are U = ')
disp(T,'The eigen vector matrix T =')
disp(T,'The KL tranform basis is =')
for i=1:n
    Y(:,i)=T*X(:,i);
end
disp(Y,'KL transformation of the input matrix Y =')
for i=1:n
    x(:,i)=T'*Y(:,i);
end
disp(x,'Reconstruct matrix of the given sample matrix X =')
```

**Output:-**

Eigen Values are U =

6.1963372

0.2147417

0.0264211

The eigen vector matrix T =

0.4384533	0.8471005	0.3002988
0.4460381	- 0.4951684	0.7455591
- 0.7802620	0.1929481	0.5949473

The KL tranform basis is =

0.4384533	0.8471005	0.3002988
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- 0.7802620	0.1929481	0.5949473

KL transformation of the input matrix Y =

6.6437095	4.5110551	9.9237632	10.662515
3.5312743	4.0755729	3.2373664	4.4289635
0.6254808	1.0198466	1.0190104	0.8336957

Reconstruct matrix of the given sample matrix X =

4.	3.	5.	6.
4.	2.	7.	7.
5.	5.	6.	7.