

# EXP 8

Title :

## simulation study of various Entropies and mutual information in a comm. System

```
clc;                                     disp(H);                               % probability P(Y)
clear all;                               %conditional probability
close all;                               matrix
i=input('Enter no. of                   1
elements=');                             for n=1:i
q=input('Enter joint                   for m=1:i
probabilities matrix=');               s(n)=w+q(m,n);
sum=0;                                  2
%probability P(x)                       w=s(n);
for n=1:i                               end
w=0;                                    end
for m=1:i                               end
p(n)=w+q(n,m);                         disp('P(Y/X):');
w=p(n);                                disp(a);
end                                      % entropy H(Y/X)
end                                      d=0;
disp('P(x):');                          for n=1:i
disp(p);                                for m=1:i
% entropy H(x)                           if(a(n,m)>0)
for n=1:i                               H1=d+(q(n,m)*log2(1/a(n,m)))
H=sum+(p(n)*log2(1/p(n)));              ;
sum=H;                                  d=H1
end                                      end
disp('H(x): ');                         end
disp(H1);                               end
disp('H(Y/X):');                       disp('MI-');
disp(m);
```

# OUTPUT:

Enter no. of elements=

d =

3

Enter joint probabilities matrix=

0.3212

ans =

[0.27 0.03 0;0 0.2 0.05;0 0.135 0.315]

P(x):

2

0.3000 0.2500 0.4500

d =

H(x):

0.5557

ans =

1.5395

2

d =

ans =

0.7178

ans =

1

H(Y/X):

2

P(Y/X):

0.7178

0.9000 0.1000 0

0 0.8000 0.2000

ans =

0 0.3000 0.7000

ans =

2

2

d =

ans =

0.0410

ans =

2

2

d =

P(Y):

0.2700 0.3650 0.3650

0.1407

ans =

H(Y):

2

1.5715

d =

MI-

0.2051

ans =

0.8537

2