

Experiment No: 08

```
clc;
clear all;
close all;
i=input('Enter no. of elements=');
q=input('Enter joint probabilities matrix=');
sum=0;
%probability P(x)
for n=1:i
w=0;
for m=1:i
p(n)=w+q(n,m);
w=p(n);
end
end
disp('P(x):');
disp(p);
% entropy H(x)
for n=1:i
H=sum+(p(n)*log2(1/p(n)));
sum=H;
end
disp('H(x): ');
disp(H);
%conditional probability matrix
1
for n=1:i
for m=1:i
a(n,m)=q(n,m)/p(n);
end
end
disp('P(Y/X):');
disp(a);
% entropy H(Y/X)
d=0;
for n=1:i
for m=1:i
if(a(n,m)>0)
H1=d+(q(n,m)*log2(1/a(n,m)));
d=H1
end
end
end
disp('H(Y/X):');
disp(H1);
% probability P(Y)
for n=1:i
w=0;
for m=1:i
s(n)=w+q(m,n);
2
w=s(n);
end
end
disp('P(Y):');
disp(s);
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% entropy H(Y)
k=0;
for n=1:i
H2=k+(s(n)*log2(1/s(n)));
k=H2;
end
disp('H(Y): ');
disp(H2);
% MI
m=H2-H1;
disp('MI-');
disp(m);

```

Output:

Enter no. of elements=3

Enter joint probabilities matrix=[0.27 0.03 0;0 0.2 0.05;0 0.135 0.315]

P(x):

0.3000 0.2500 0.4500

H(x):

1.5395

ans =1

P(Y/X):

0.9000 0.1000 0

0 0.8000 0.2000

0 0.3000 0.7000

d = 0.0410

d =0.140

d = 0.2051

d = 0.3212

d =0.5557

d =0.7178

$H(Y/X):$

0.7178

ans = 2

ans = 2

ans = 2

ans =2

ans =2

ans =2

ans =2

ans =2

ans =2

$P(Y):$

0.2700 0.3650 0.3650

$H(Y):$

1.5715

MI-

0.8537