```
clc;
clear all;
close all;
for i = 1:2
px(i) = input("Enter P(xi) = ");
end
py = [0 0];
pygx = [0 0;0 0];
for i = 1:2
    for j = 1:2
        pygx(i,j) = input("Enter P(yj/xi) = ");
    end
end
for i= 1:2
    for j = 1:2
        Py = (px(j)*pygx(j,i));
        py(i) = py(i)+Py;
    end
end
hx = 0;
for i = 1:2
    h = px(i)*(log(1/px(i))/log(2));
    hx = hx + h;
end
hy = 0;
for i = 1:2
    y = py(i)*(log(1/py(i))/log(2));
    hy = hy + y;
end
for i = 1:2
    for j = 1:2
        pxy(i,j) = pygx(j,i)*px(i);
    end
end
Hygx = 0;
for i = 1:2
    for j = 1:2
        hygx = pxy(i,j) * log(1/pygx(j,i))/log(2);
        Hygx = Hygx + hygx;
    end
end
HYGX = Hygx;
Hxy = hx + HYGX;
lxy = hy -HYGX;
disp("P(x)");
disp(px)
disp("P(y/x");
disp(pygx);
disp("P(y)");
disp(py);
disp("H(x)");
disp(hx);
disp("H(y)");
disp(hy);
```

```
disp("P(x,y)");
disp(pxy);
disp("H(y|x)");
disp(HYGX);
disp("I(x;y)");
disp(lxy);
Hx = 0;
px =  0:0.01:1;
for i = 1:length(px)
    q = 1 - px(i);
    Hx(i) = -px(i)*log2(px(i))-q*log2(q);
end
plot(px,Hx);
grid on;
xlabel("Probability p(x)");
ylabel("Entropy H(x)");
```

Output :

```
Enter P(xi) = 0.5

Enter P(xi) = 0.5
Enter P(yj/xi) = 0.6
Enter P(yj/xi) = 0.4
Enter P(yj/xi) = 0.4
Enter P(yj/xi) = 0.6
P(x)
    0.5000    0.5000

P(y/x
    0.6000    0.4000
    0.4000    0.6000

P(y)
    0.5000    0.5000

H(x)
     1

H(y)
     1

P(x,y)
    0.3000    0.2000
    0.2000    0.3000

H(y|x)
    0.9710

I(x;y)
    0.0290

>>
```

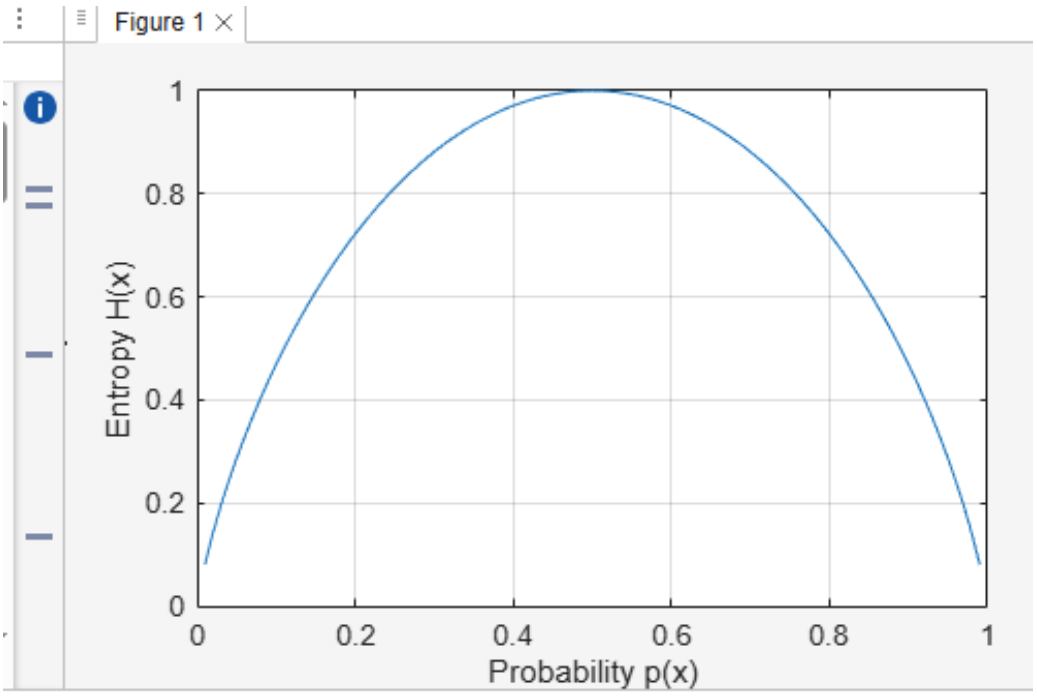
Figure 1
Entropy H(x)
Probability p(x)
0
0.2
0.4
0.6
0.8
1