**Arithmetic Coding**

clear all;

clc;

format long

fprintf('Input the message to be encoded');

a=input('');

l=length(a);

b=input('Symbols:');

n=length(b)

p=input('Enter the probability:');

for i=1:n

array1(i)=b(i);

end

for i=1:n

j=1;

if (i==1)

array2(i,j)=0;

array2(i,j+1)=p(1,i);

else

array2(i,j)=array2(i-1,j+1);

array2(i,j+1)=p(1,i)+array2(i-1,j+1);

end

lowr(i)=array2(i,j);

highr(i)=array2(i,j+1);

end

low=0;

high=1;

for i=1:l

for j=1:n

if(a(i)==b(j))

coder=high-low;

high=low+((coder)\*highr(j));

low=low+((coder)\*lowr(j));

end

end

end

LOW=low;

HIGH=high;

disp('code:')

disp(LOW)

%decoding

code=low;

disp('decoding...')

temp='';

for i=1:l

for j=1:n

if(code>=lowr(j) && code<=highr(j))

x=j;

break;

end

end

temp(i)=b(x);

code=(code-lowr(x))/((highr(x)-lowr(x)));

code = code+0.000000000000001;

end

disp(temp);

**OUTPUT:**

Input the message to be encoded'SWISS MISS'

Symbols:[' ' 'M' 'I' 'W' 'S']

n =

5

Enter the probability:[0.1 0.1 0.2 0.1 0.5]

code:

0.717533750000000

decoding...

SWISS MISS