

TITLE: Huffman coding.

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clc;
clear all;
close all;
prob=input('input elements of probability array');
%prob=[0.2 0.4 0.2 0.1 0.1];
l=length(prob);
code={};
str='';
for i=1:l
    ip(i,:)=[prob(i) i];
end
disp('ip=');
disp(ip);
hu=ip;
s=size(ip);
n1=s(1);
n=n1;
hu=user_rec(ip,hu,n,n1);

s1=size(hu);
for i=1:s1(1)
    str='';
    for j=s1(2):-1:3
        if hu(i,j)~= -9
            a=hu(i,j);
            b=num2str(a);
            str=strcat(str,b);
        end
    end
    code={code{:} str};
end
disp('codes are:');
disp(code);

%function user_rec

function[hu]=user_rec(ip,hu,n,n1)

while ip(1,1)~=1
    ip=user_sort(ip,n1);
    ip(n1-1,1)=ip(n1,1)+ip(n1-1,1);
    for k=n:-1:1
        if hu(k,2)==ip(n1-1,2)
            hu(k,n-n1+3)=0;
        else if hu(k,2)==ip(n1,2)
            hu(k,n-n1+3)=1;
            hu(k,2)=ip(n1-1,2);
        else
            hu(k,n-n1+3)=-9;
        end
    end
    n1=n1-1;
end

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end
disp('hu=');
disp(hu);

%function for sorting
function[ip]=user_sort(ip,n1)

temp=[0 0];
for i=1:n1-1
    for j=1:n1-1
        if ip(j,1)<ip(j+1,1)
            temp(:)=ip(j,:);
            ip(j,:)=ip(j+1,:);
            ip(j+1,:)=temp(:);
        end
    end
end
end

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OUTPUT:

input elements of probability array[2/9 3/9 2/9 1/9 1/9]

ip=

0.2222	1.0000
0.3333	2.0000
0.2222	3.0000
0.1111	4.0000
0.1111	5.0000

hu=

0.2222	2.0000	-9.0000	-9.0000	1.0000	0
0.3333	2.0000	-9.0000	-9.0000	0	0
0.2222	2.0000	-9.0000	0	-9.0000	1.0000
0.1111	2.0000	0	1.0000	-9.0000	1.0000
0.1111	2.0000	1.0000	1.0000	-9.0000	1.0000

codes are:

'01' '00' '10' '110' '111'