DIT

function [z] = butterfly\_dit(x,N)

z=[]

z1=[]

z2=[]

for k=1:N/2

w=exp(-j\*2\*pi\*(k-1)/N)

z1=[z1,x(k)+x(k+N/2)\*w]

z2=[z2,x(k)-x(k+N/2)\*w]

end

z=[z1,z2]

end

DIF

function [z] = butterfly\_dif( x,N )

z=[]

z1=[]

z2=[]

for k=1:N/2

w=exp(-j\*2\*pi\*(k-1)/N)

z1=[z1,x(k)+x(k+N/2)]

z2=[z2,(x(k)-x(k+N/2))\*w]

end

z=[z1,z2]

end

Q.1

clc

close all

clear all

v=[1 1 1 1 1 1 1 1]

x=bitrevorder(v)

N=8;

z=[]

for i=1:N/4:N

g=[x(i),x(i+1)]

y=butterfly\_dit(g,N/4)

z=[z y]

end

z1=[]

for i=1:N/2:N

g1=[z(i:i+3)]

y1=butterfly\_dit(g1,N/2)

z1=[z1 y1]

end

[z2]=butterfly\_dit(z1,N)

z2

Q.2

clc

close all

clear all

x=[1 1 1 1 1 1 1 1]

N=8;

y1=butterfly\_dif(x,N)

y2=[]

for i=1:N/2:N

g2=[y1(i:i+3)]

z2=butterfly\_dif(g2,N/2)

y2=[y2 z2]

end

y3=[]

for i=1:N/4:N

g=[y2(i),y2(i+1)]

z3=butterfly\_dif(g,N/4)

y3=[y3 z3]

end

y3=bitrevorder(y3)

Q.3

clc

close all

clear all

v=[1 2 3 4 4 3 2 1]

x=bitrevorder(v)

N=8;

z=[]

for i=1:N/4:N

g=[x(i),x(i+1)]

y=butterfly\_dit(g,N/4)

z=[z y]

end

z1=[]

for i=1:N/2:N

g1=[z(i:i+3)]

y1=butterfly\_dit(g1,N/2)

z1=[z1 y1]

end

[z2]=butterfly\_dit(z1,N)

z2

Q.4

clc

close all

clear all

x=[1 2 3 4 4 3 2 1]

N=8;

y1=butterfly\_dif(x,N)

y2=[]

for i=1:N/2:N

g2=[y1(i:i+3)]

z2=butterfly\_dif(g2,N/2)

y2=[y2 z2]

end

y3=[]

for i=1:N/4:N

g=[y2(i),y2(i+1)]

z3=butterfly\_dif(g,N/4)

y3=[y3 z3]

end

y3=bitrevorder(y3)