

%ques.9 Fast fourier transform

```
A=[110 20 140 0 220;  
    60 34 23 198 20;  
    15 12 126 230 15;  
    140 28 10 28 10;  
    11 12 19 85 100];  
  
FFT_row = zeros(size(A));  
FFT_col = zeros(size(A));  
  
%Perform FFT on each row  
for i=1:size(A,1)  
    FFT_row(i,:) = fft(A(i,:));  
end  
  
display(FFT_row);
```

```
FFT_row = 5x5 complex  
102 x  
    4.9000 + 0.0000i    0.7090 + 1.0792i   -0.4090 + 2.5070i   -0.4090 - 2.5070i ...  
    3.3500 + 0.0000i   -1.0211 + 0.8955i    0.8461 - 1.7466i    0.8461 + 1.7466i  
    3.9800 + 0.0000i   -2.6467 + 0.6398i    1.0317 - 0.9715i    1.0317 + 0.9715i  
    2.1600 + 0.0000i    1.2100 - 0.0654i    1.2100 - 0.2770i    1.2100 + 0.2770i  
    2.2700 + 0.0000i   -0.3853 + 1.2249i   -0.4747 - 0.1104i   -0.4747 + 0.1104i
```

```
%display(abs(FFT_row));  
  
%Perform FFT on each column  
for i=1:size(A,2)  
    FFT_col(:,i) = fft(FFT_row(:,i));  
end  
  
display(FFT_col);
```

```
FFT_col = 5x5 complex  
103 x  
    1.6660 + 0.0000i   -0.2134 + 0.3774i    0.2204 - 0.0598i    0.2204 + 0.0598i ...  
    0.1669 - 0.2097i    0.1538 + 0.4141i   -0.4072 + 0.1792i   -0.0144 - 0.4095i  
    0.2251 + 0.1096i    0.0539 - 0.3753i   -0.0318 + 0.2678i    0.0285 - 0.4570i  
    0.2251 - 0.1096i    0.2267 + 0.2836i    0.0285 + 0.4570i   -0.0318 - 0.2678i  
    0.1669 + 0.2097i    0.1335 - 0.1602i   -0.0144 + 0.4095i   -0.4072 - 0.1792i
```

```
%display(abs(FFT_col));  
  
%INVERSE FOURIER TRANSFORM  
  
IFFT_row = zeros(size(A));  
IFFT_col = zeros(size(A));  
  
%Perform Inverse Fourier Transform on each column  
for i=1:size(A,2)  
    IFFT_col(:,i) = ifft(FFT_col(:,i));  
end
```

```
%Perform IFFT on each row
```

```
for i=1:size(A,2)  
IFFT_row(:,i) = ifft(IFFT_col(:,i));  
end
```

```
display(abs(A))
```

110	20	140	0	220
60	34	23	198	20
15	12	126	230	15
140	28	10	28	10
11	12	19	85	100