

## Experiment No 8

**AIM-** To demonstrate convolution of two signals using DTFT property.

```
%To demonstrate convolution using DTFT property
```

```
clc;  
close all;  
clear all;
```

```
x=[1 2 3 4 5 6 7 8 9] % First Discrete Signal
```

```
x = 1x9  
    1     2     3     4     5     6     7     8     9
```

```
h=[1 -2 3 -2 1]% Second Signal
```

```
h = 1x5  
    1    -2     3    -2     1
```

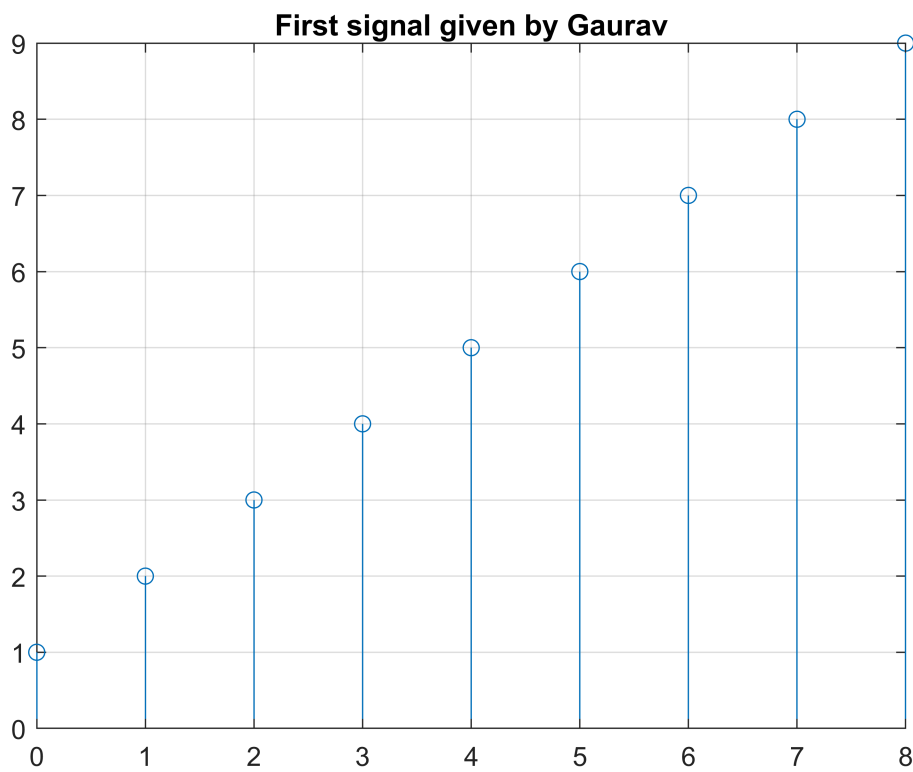
```
n1=0:8 % time axis for first signal
```

```
n1 = 1x9  
     0     1     2     3     4     5     6     7     8
```

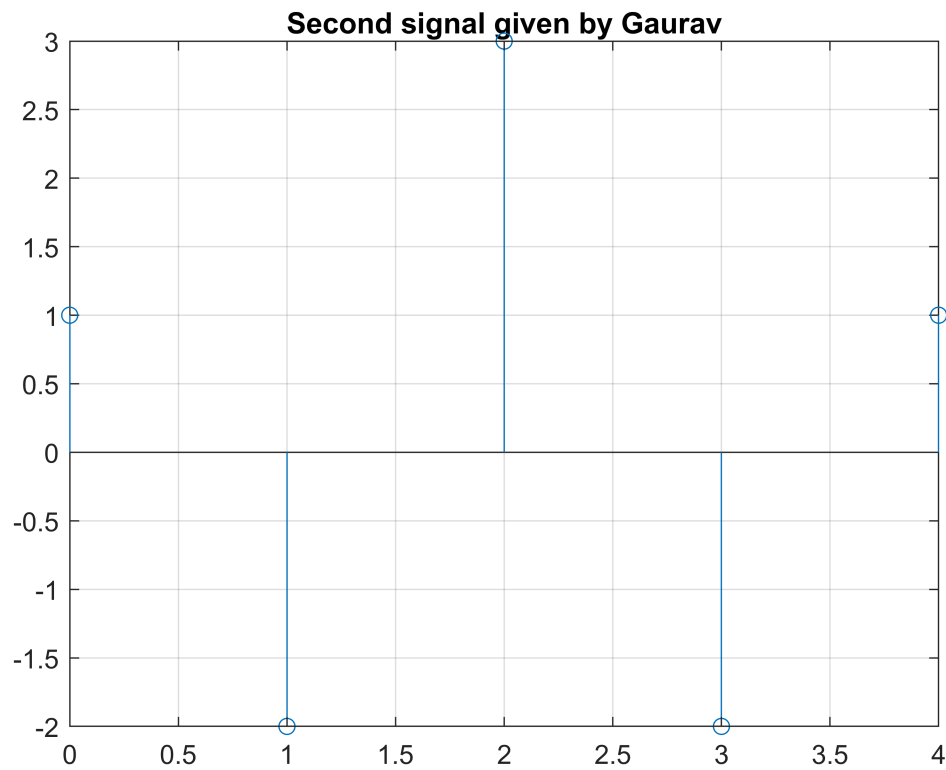
```
n2=0:4 %time for second signal
```

```
n2 = 1x5  
     0     1     2     3     4
```

```
stem (n1,x)  
title('First signal given by Gaurav')  
grid on;
```



```
stem (n2,h)
title('Second signal given by Gaurav')
grid on;
```



```
k=0:511 % 512 frequency sample
```

```
k = 1x512
    0     1     2     3     4     5     6     7     8     9    10    11    12 ...
```

```
w=k*(pi/511) % sampled frequency axis
```

```
w = 1x512
    0    0.0061    0.0123    0.0184    0.0246    0.0307    0.0369    0.0430 ...
```

```
X=x*exp(-j*(pi/256)).^(n1'*k) % DTFT of First Signal
```

```
X = 1x512 complex
45.0000 + 0.0000i 44.8871 - 2.9421i 44.5493 - 5.8657i 43.9888 - 8.7523i ...
```

```
H=h*exp(-j*(pi/256)).^(n2'*k) % DTFT of second Signal
```

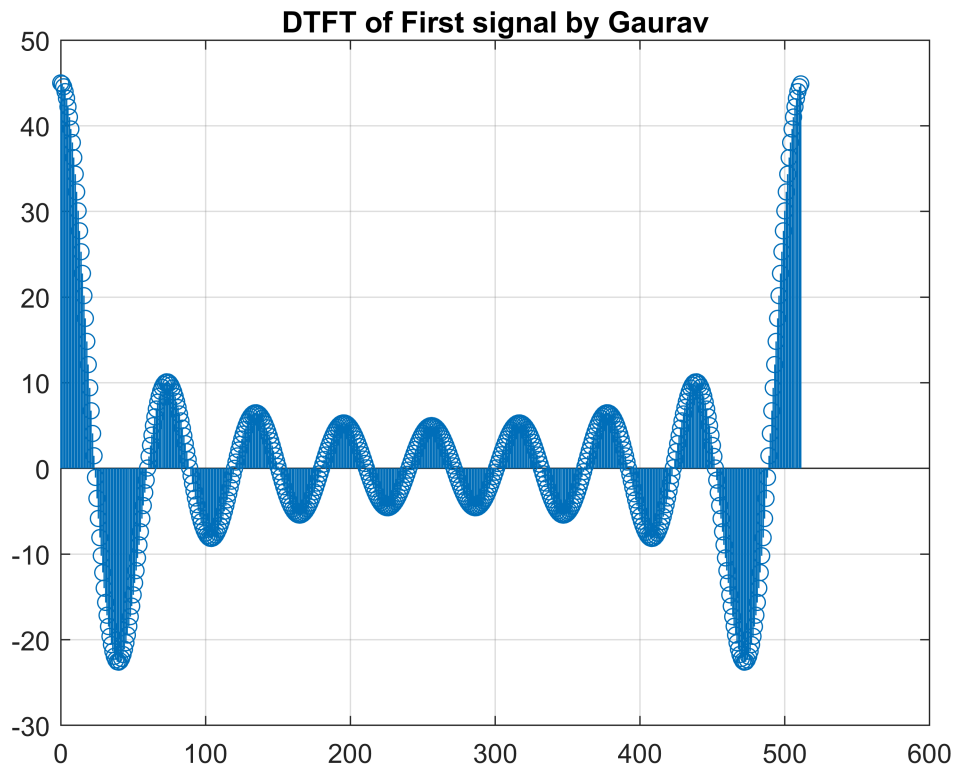
```
H = 1x512 complex
1.0000 + 0.0000i 0.9994 - 0.0245i 0.9976 - 0.0490i 0.9946 - 0.0734i ...
```

```
stem (k,X)
```

Warning: Using only the real component of complex data.

```
title('DTFT of First signal by Gaurav')
```

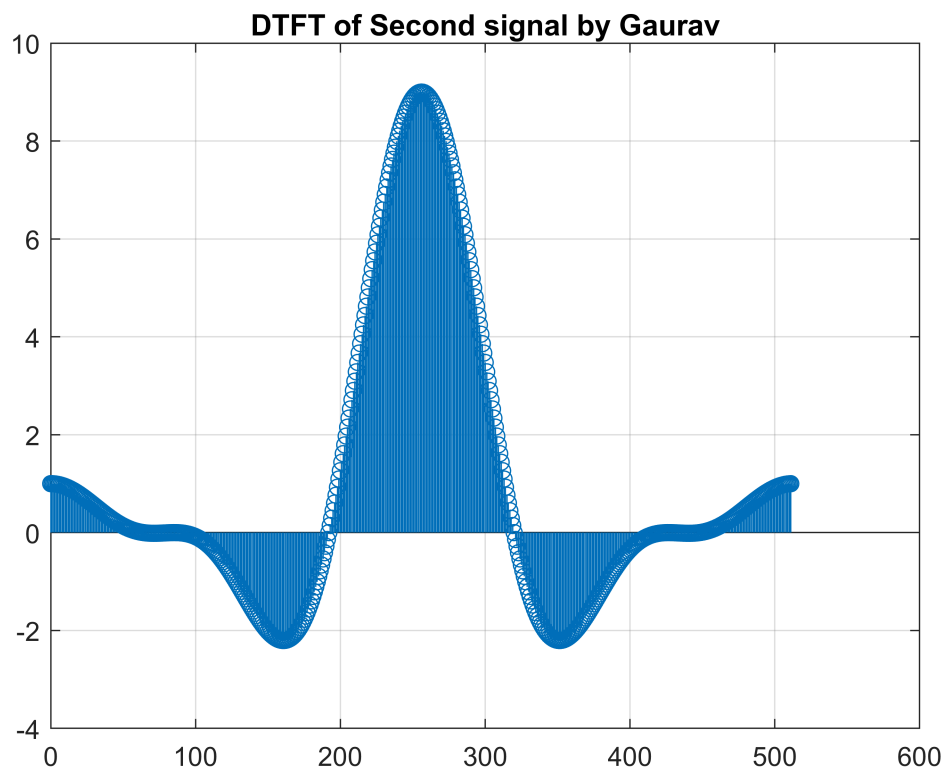
```
grid on;
```



```
stem (k,H)
```

Warning: Using only the real component of complex data.

```
title('DTFT of Second signal by Gaurav')  
grid on;
```



```
conv=X.*H      % convolution
```

```
conv = 1×512 complex
 45.0000 + 0.0000i  44.7879 - 4.0416i  44.1546 - 8.0349i  43.1087 -11.9322i ...
```

```
stem(k,conv)   % plotting of convolution
```

Warning: Using only the real component of complex data.

```
title ('Convolution of two Signals using DTFT property')
grid on;
```

