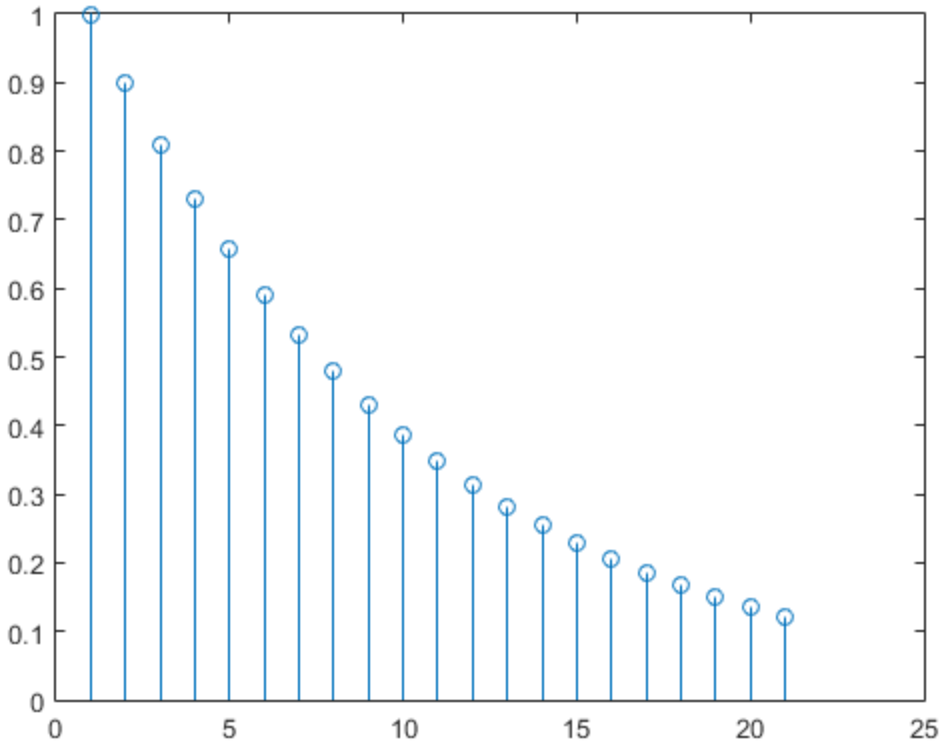
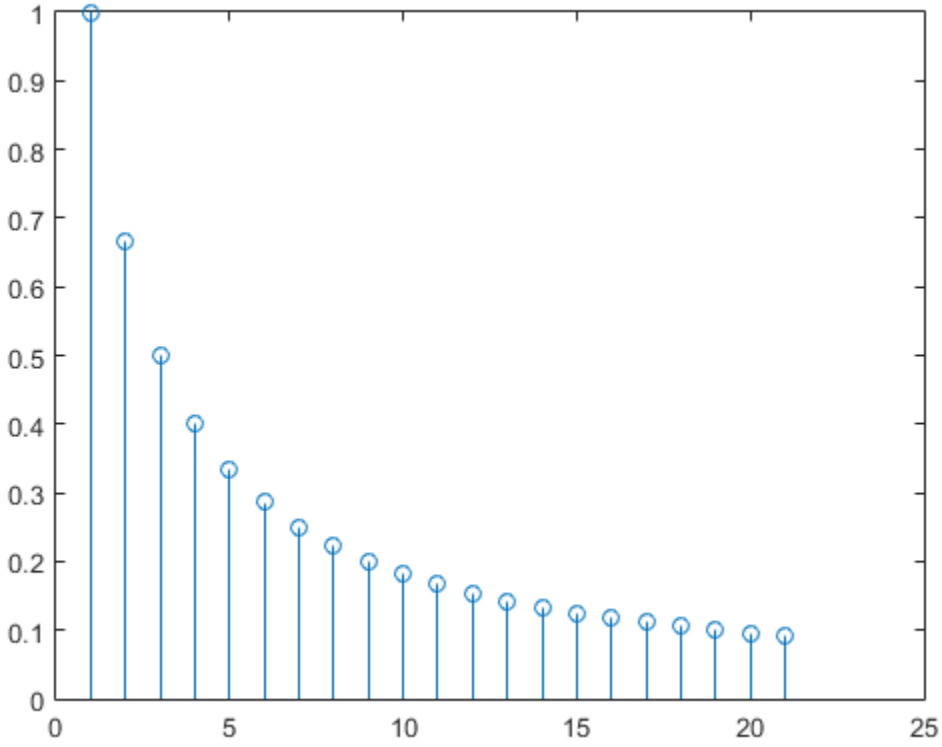
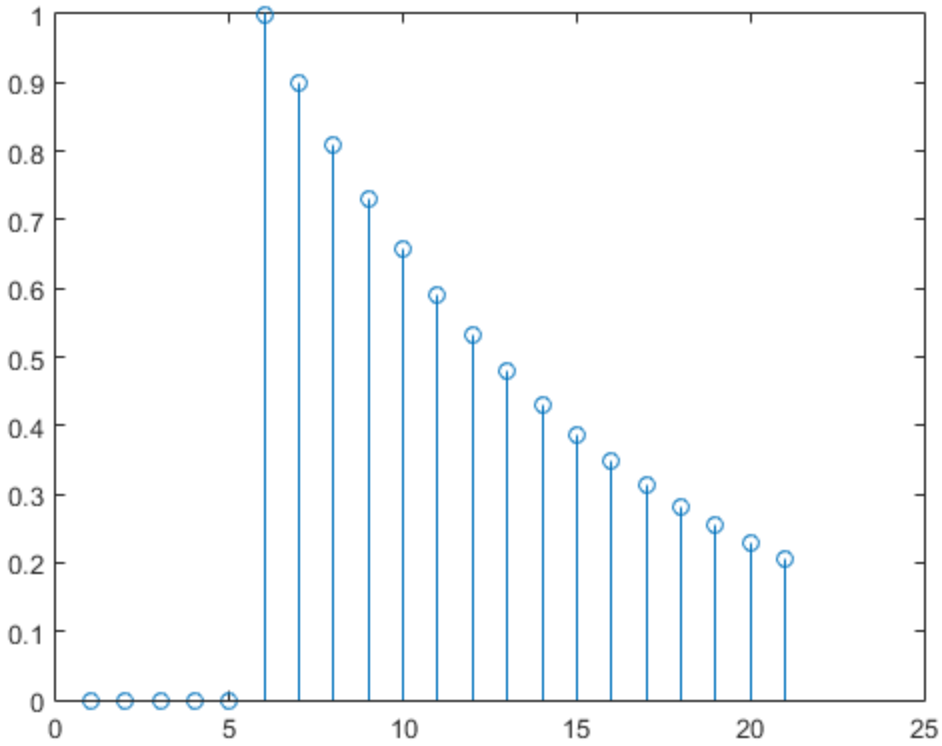
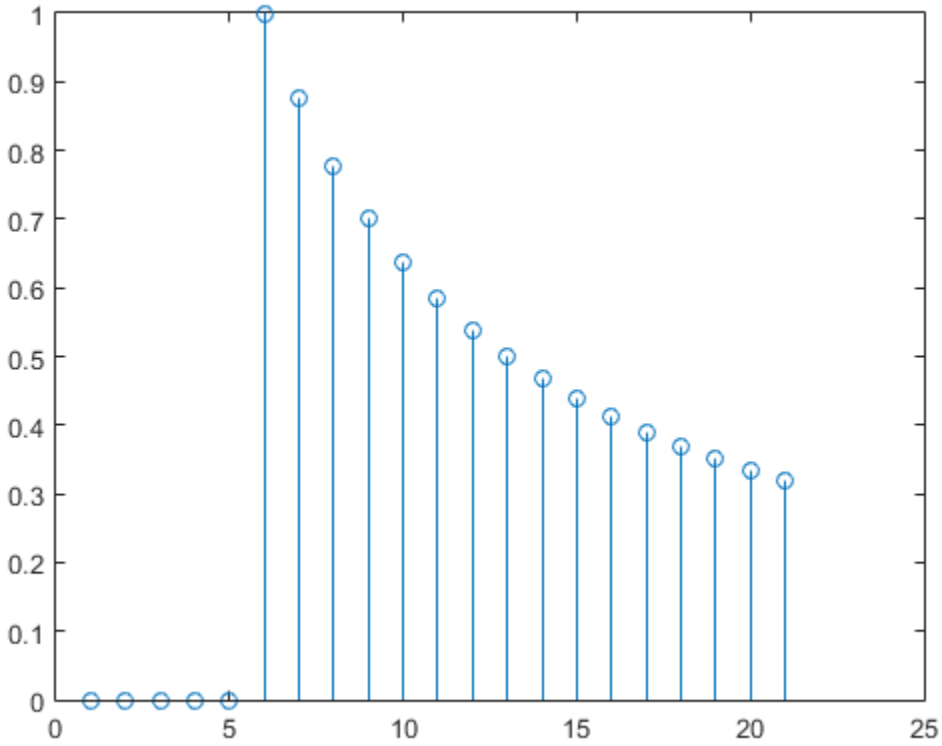
```
clear all;

%difference equation
a(1) = 1;
a(2) = -0.9;
b(1) = 1;

%impulse response
x = zeros(1,21);
x(1) = 1;

%equation a
yf = filter(b,a,x);
stem(yf);

%equation b
y = zeros(1,21);
y(1) = x(1);
for i = 2:21
    y(i) = i * y(i - 1) / (i + 1) + x(i);
end
stem(y);

%shifted impulse response
x(1) = 0;
x(6) = 1;

%equation a
yf = filter(b,a,x);
stem(yf);

%equation b
y = zeros(1,21);
y(1) = x(1);
for i = 2:21
    y(i) = i * y(i - 1) / (i + 1) + x(i);
end
stem(y);
```

→Code for 7


1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
5
10
15
20
25

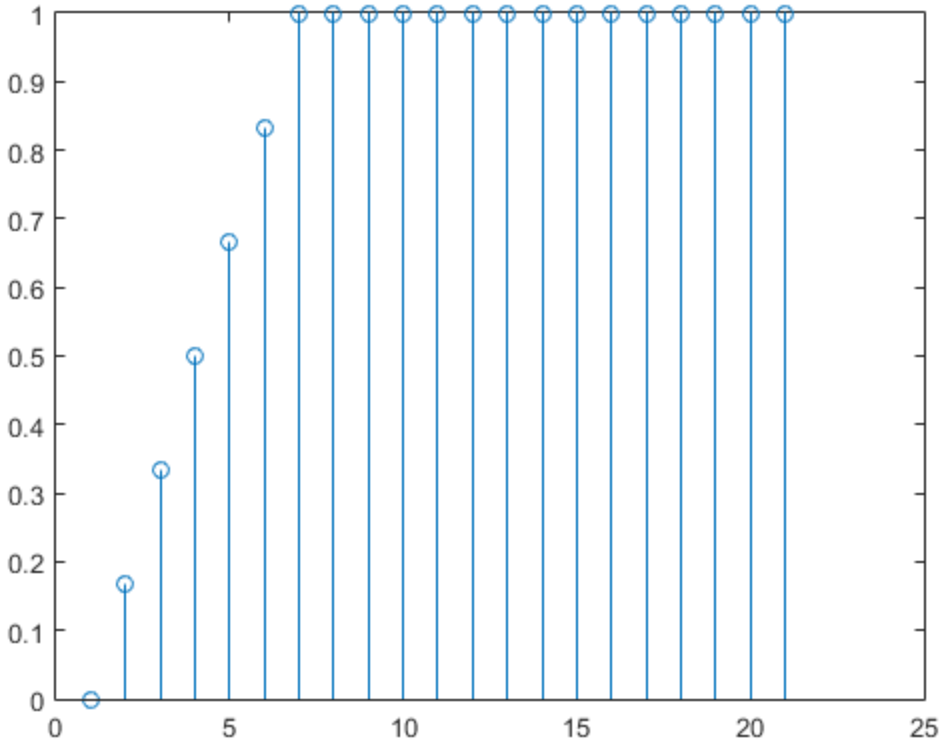

1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
5
10
15
20
25


1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
5
10
15
20
25


1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
5
10
15
20
25

```
clear all;
load handel.mat;

%read the sound file
Fs = 8192;

b(1) = 1;

%different values of tau
a1(1) = 1;
a1(411) = -0.7;

a2(1) = 1;
a2(820) = -0.7;

a3(1) = 1;
a3(4097) = -0.7;

y1 = filter (b, a1, y);
sound(y1);

y2 = filter (b, a2, y);
sound(y2);

y3 = filter (b, a3, y);
sound(y3);
```

→ Code for 19

```
clear all;

u = ones(1,21);
u(1) = 0;

a(1) = 1;
a(2) = -1; % y[n-1]

b(1) = 1/6;
b(7) = -1/6; % x[n-6]

y = filter(b, a, u);
stem(y);
```

→Code for 18