

## Contents

---

- [Part B\)](#)
- [Part C\)](#)

```
clear;
channel;

%where impulse4' = [h4 h3 h2 h1];
[J4, impulse4] = estimateResponse(N,4,x_known,y_known)
```

```
J4 =

    10.3245
```

```
impulse4 =

    1.1205
    0.0080
   -0.0958
    0.1721
```

## Part B)

---

```
for i=3:10
    J(i) = estimateResponse(N,i,x_known,y_known);
end
```

```
figure;
plot(3:10, J(3:10));
xlabel('Length of impulse response');
ylabel('Cost Function');
```

```
J(3:10)
```

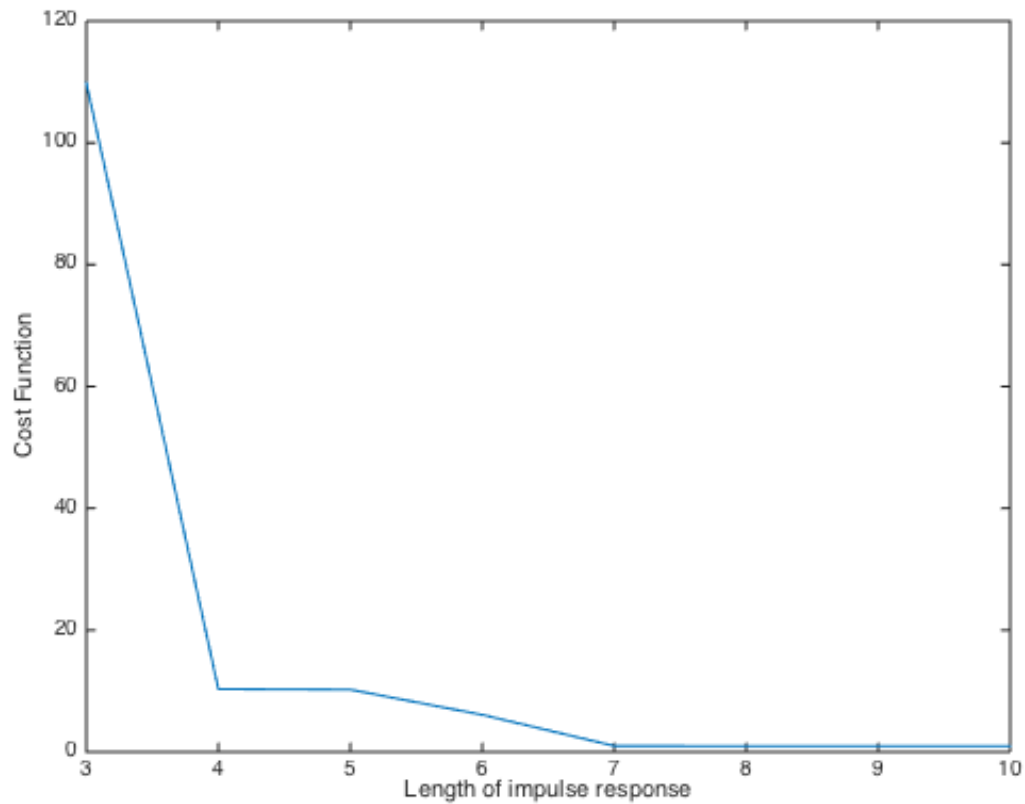
```
ans =
```

```
Columns 1 through 7
```

```
109.8208    10.3245    10.2338     6.0975     0.9878     0.9672     0.9635
```

```
Column 8
```

```
0.9592
```



### Part C)

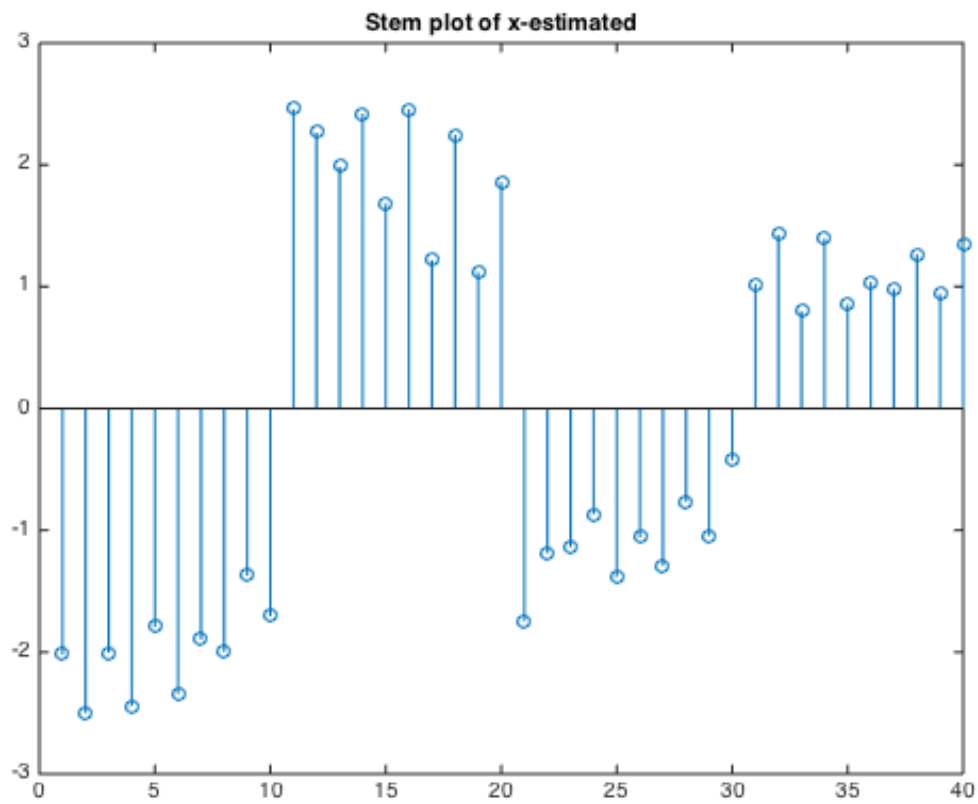
```
%where impulse7' = [h7 h6 h5 h4 h3 h2 h1];
[J7, impulse7] = estimateResponse(N,7,x_known,y_known);

%Create H matrix
M = 7;
H = zeros(N+10,N);
for i = 1:N+10
    if (i<=M)
        H(i, 1:i) = impulse7(flip(1:i))';
        %H(i, 1:i) = flip(1:i);
    elseif(i>N)
        H(i,i-M+1:N) = impulse7(flip(i-N+1:7))';
        %H(i,i-M+1:N) = flip(i-N+1:7);
    else
        %H(i, i-M+1:i-M+7) = flip(1:7);
        H(i, i-M+1:i-M+7) = impulse7(flip(1:7))';
    end
end

x_est = (H'*H)\H'*y_unknown;
figure;
stem(x_est(1:40));
title('Stem plot of x-estimated');
['The residual for the estimated x for N values is: ' num2str( norm( y_unknown(1:N) - H(1:N
,1:N)*x_est(1:N))^2)]
```

ans =

The residual for the estimated x for N values is: 0.54457



---

Published with MATLAB® R2014b