```
clear;
close;
home;


%sample frequency is 1 per day
data = csvread("StockData_2015_2025.csv");
price = data(:,2);
days = data(:,1);


%filter
%window size
w = 10;
%filter kernel
fk = ones(w)/(w^2);
fk = fk(:);
fprice = conv(price,fk);

%resize to original data
fprice = fprice(1:length(price));



figure(1);
plot(days,price,'-','color','m');
hold on;
plot(fprice,'-','color','k');
hold off;
xlabel("Days");
ylabel("Price (USD)");

%test case for fft to make sure its working correct
%price = zeros(length(price));
%price(1) = 1;




X = fft(price);
%in test case of unit impulse using "end" causes the length function to return unusually large result this is a work around that doesn't cause this
X = X(1:length(X)/2);
X = abs(X);
```

```
fX = fft(fprice);
fX = fX(1:length(fX)/2);
fX = abs(fX);

%in general the graph does not contain any major peaks beyond that occurring at 0. This would mean the data contains noise and little periodic continuity. This doesn't negate the possibility of linear growth which the raw data does show however just that the growth is not preceded or succeeded by any significant degrowth.
figure(2);
%while 0 to 1 days had the most significant being the largest peak another smaller one occurs at every 4 days
%subplot(2,1,1);
%plot(X);
%title("Data Full View");
%shows the second peak more clearly
%subplot(2,1,2);
%plot(X(1:100));
%title("Data From 1-100");


subplot(2,1,1);
plot(X);
title("Unfiltered Data");
subplot(2,1,2);
plot(fX);
title("Filtered Data");
%as the filter window size increases making a more intense result the graph of the magnitude of the dft becomes smoother. This makes sense as noise is being reduced so less distinct patterns exist. this means that the frequency that do comprise the graph become less varied and more predictable ie smoother
```