```
clear
clc
x=[1.25,2.50,5,10,20,30,40]'; %Dummy Data, fill in here
y=[30151.89357,59543.53432,117599.5737,233857.5235,448633.0221,668863.0719,896864.0854]';
  %Dummy Data, fill in here
for i=1: length (x)
    w(i)=1/(x(i)); % FORMULA FOR 1/X! Comment in line #8 if you want 1/X^2
    %To calculate for 1/x^2 use the line below
    %w(i)=1/(power(x(i),2));
end

D=[ones(length(x),1), x, power(x,2)]; %Design Matrix where first column is 1,
 then X then X^2
D
W=zeros(length(x),length(x)); %this plus the for loop below generates W=
 matrix you see when run.%
for i=1:length(x)
    for j=i:length(x)
    if j==i
        W(i,j)= w(i);
    else
        W(i,j)= 0;
    end
    end
end

W
A=D'*W*D; %D' is transposed of D then multiple by Weight and D matrix.%
A
coefficients_weighted = inv(A)*(D'*W*y) %Final Result for co-efficients%

fprintf('y=%fx^2+%fx+
%f',coefficients_weighted(3),coefficients_weighted(2),coefficients_weighted(1))
```

```
D =

   1.0e+03 *

    0.0010    0.0013    0.0016
    0.0010    0.0025    0.0063
    0.0010    0.0050    0.0250
    0.0010    0.0100    0.1000
    0.0010    0.0200    0.4000
    0.0010    0.0300    0.9000
    0.0010    0.0400    1.6000


W =

    0.8000         0         0         0         0         0         0
         0    0.4000         0         0         0         0         0
         0         0    0.2000         0         0         0         0
```

```
         0         0         0    0.1000         0         0         0
         0         0         0         0    0.0500         0         0
         0         0         0         0         0    0.0333         0
         0         0         0         0         0         0    0.0250
```

```
A =

   1.0e+05 *

    0.0000    0.0001    0.0011
    0.0001    0.0011    0.0303
    0.0011    0.0303    1.0014
```

```
coefficients_weighted =

   1.0e+04 *

    0.2098
    2.2931
   -0.0017
```

```
y=-17.447531x^2+22930.975329x+2097.746974
```

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