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% MACM 316 - Homework 1
% Floating Point Arithmetic
% Description: Performs n-fold square-rooting following by squaring of
% the number x
% File name: FloatPt.m

clear
format long
n=49;
st=0.001; % Define a stepsize
x=0:st:5; % x is a row vector of numbers between 0 and 5 of increments st
y=x;

for j =1:n
    for i=1:j
     y=nthroot(y,2);
    end

    for i=1:j
    y=y.^2; % The '.' here means the squaring is carried out on each element
 of y
    end

     if(isequal(round(x,3),round(y,3))) %to find values where x and y are
 equal upto 3 decimal places
        fprintf("They're equal at this n value: %d \n",j);
        error = abs(x-y);

    else
        fprintf("They're not equal at this n value: %d \n",j)
    end
end


% Plot the output y versus the input x
 plot(x,y)
title(['Output of the Computation with n = ' num2str(j)],'fontsize',14)
xlabel(['Input x'],'fontsize',12)
ylabel(['Output y'],'fontsize',12)

% Plot the output errors versus the input x
figure(2)
plot(x,error)
title("Error")
xlabel("Input x")
ylabel("Error")
```

```
They're equal at this n value: 1
They're equal at this n value: 2
They're equal at this n value: 3
They're equal at this n value: 4
They're equal at this n value: 5
They're equal at this n value: 6
```

```
They're equal at this n value: 7
They're equal at this n value: 8
They're equal at this n value: 9
They're equal at this n value: 10
They're equal at this n value: 11
They're equal at this n value: 12
They're equal at this n value: 13
They're equal at this n value: 14
They're equal at this n value: 15
They're equal at this n value: 16
They're equal at this n value: 17
They're equal at this n value: 18
They're equal at this n value: 19
They're equal at this n value: 20
They're equal at this n value: 21
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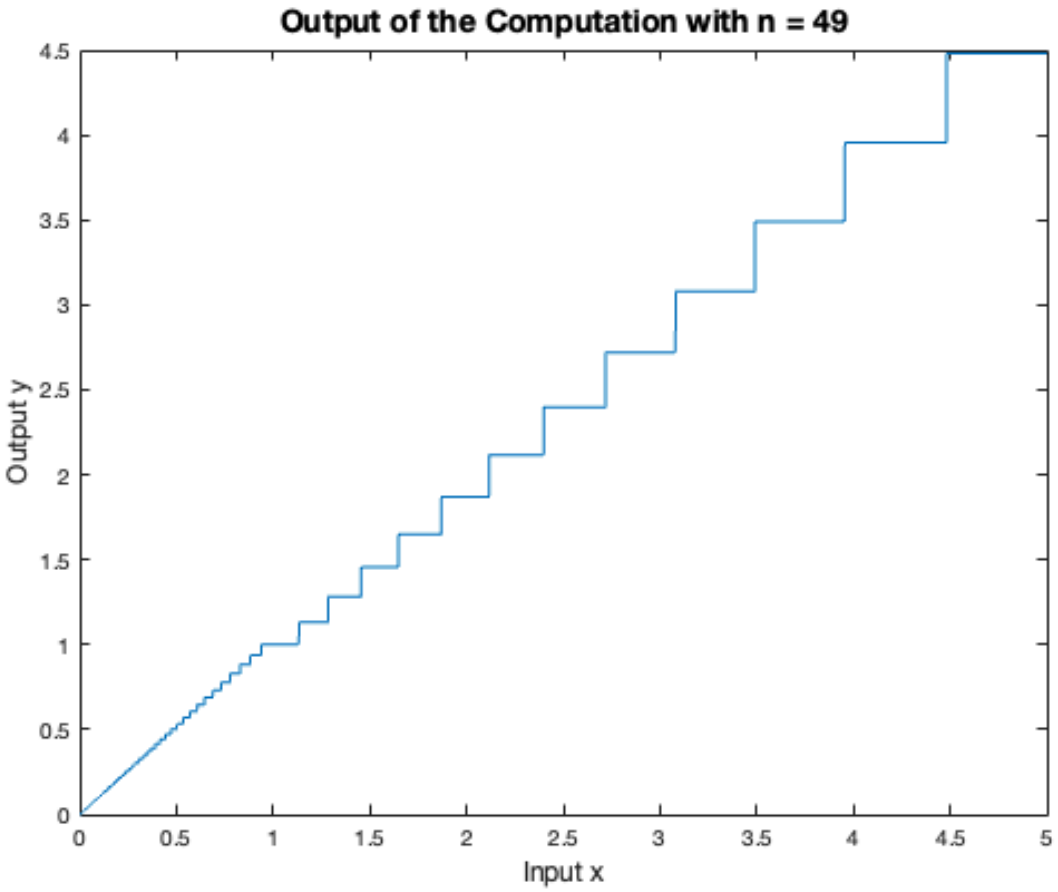
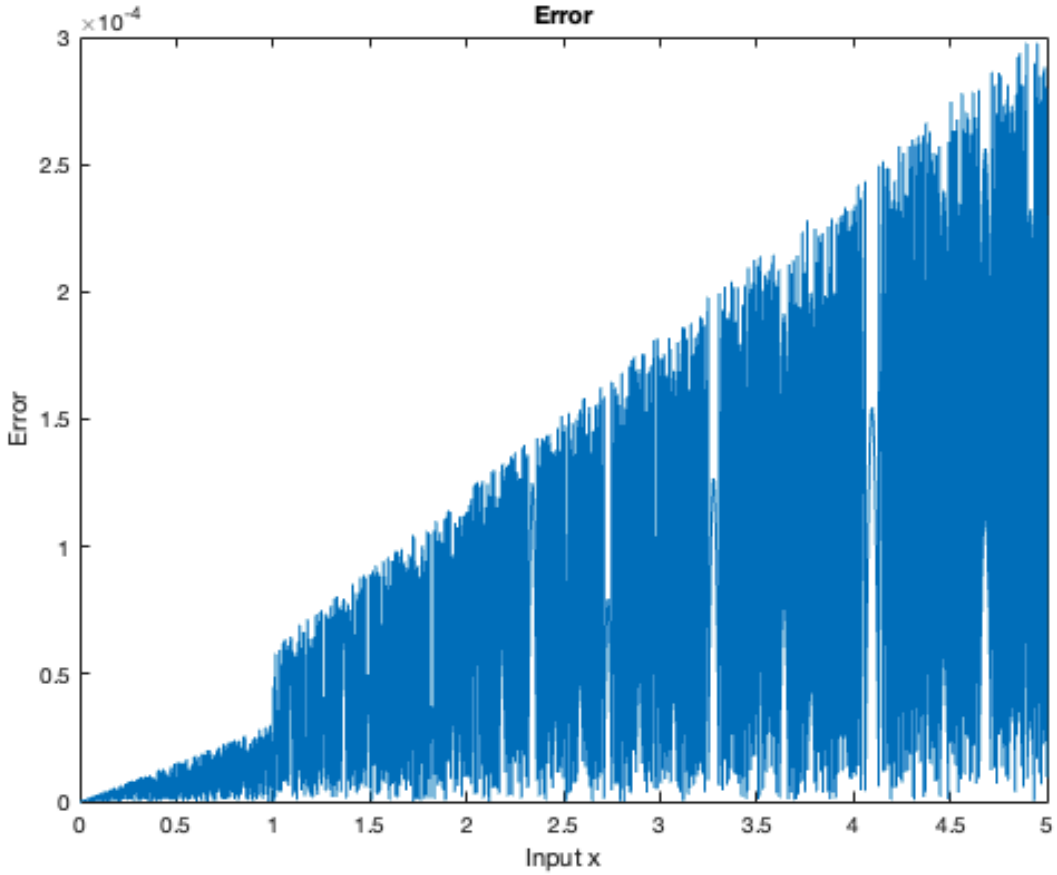
They're equal at this n value: 33
They're equal at this n value: 34
They're equal at this n value: 35
They're equal at this n value: 36
They're equal at this n value: 37
They're equal at this n value: 38
They're not equal at this n value: 39
They're not equal at this n value: 40
They're not equal at this n value: 41
They're not equal at this n value: 42
They're not equal at this n value: 43
They're not equal at this n value: 44
They're not equal at this n value: 45
They're not equal at this n value: 46
They're not equal at this n value: 47
They're not equal at this n value: 48
They're not equal at this n value: 49
```


Output of the Computation with n = 49
Output y
Input x
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5



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