EGME 2050 Computational Methods
Spring 2022

Lab Week 6

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Problem 1: Section 32.1

```
f= @(x) cos(x)*cosh(x)+1; %Creates an anonymous function
tol=1e-8; %Sets tolerance
y=[];
for i=0:.2:11 %Counts from 0 to 11 increments of .2
    a=i; %Lower bound guess
    b=i-.2; %Upper bound guess
    c=(a+b)/2; %Halfway between Upper and Lower bound
    tol=1e-8; %Sets tolerance
    d=abs(b-a)/2; %Maximum error of our guess
        while d>tol
            %Checks if their is a sign change, 0 crossing
                 if f(a)*f(c)>0
                %If there is not a sign change, the 0 is not between
                % a and c, so we set a=c
                    a=c;
            else
                %If there is a sign change, it means the 0 is between
                % a and c, so we set b=c
                    b=c;
                 end
                 d=abs(b-a)/2; %d is the maximum error
                 c=(a+b)/2; %c is halfway between our two points
        end
        y=[y,c]; %Makes an array adding up different values of c
    end
end
```

Problem 2: Section 32.2

```
%Creates an anonymous function for distance from (2,0).
%By subtracting 3 we make a distance of 3 from the point at a 0 crossing.
%So we can use root finding to find that point
    f= @(x) sqrt((x-2)^2+x^4)-3; %Distance from (2,0) -3
    a=0; %Lower bound guess
    b=2; %Upper bound guess
    c=(a+b)/2; %Halfway between Upper and Lower bound
    tol=1e-8; %Sets tolerance
    d=abs(b-a)/2; %Maximum error of our guess
    while d>tol
        %Checks if their is a sign change, 0 crossing
             if f(a)*f(c)>0
            %If there is not a sign change, the 0 is not between
            % a and c, so we set a=c
                    a=c;
        else
            %If there is a sign change, it means the 0 is between
            % a and c, so we set b=c
                    b=c;
             end
             d=(b-a)/2; %d is the maximum error
             c=(a+b)/2; %c is halfway between our two points
    end
    x=c
```