Swapnil Daxini (V00861672) Assignment 2 Question 2

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Part a) Bisect M-file

```
type Bisect.m
```

```
function root = Bisect ( xl , xu , eps , imax, f, enablePlot )

    i = 1;

    f_l = f(xl);
    f_u = f(xu);

    if enablePlot == 1
        hold on;
    end

    fprintf ('iteration approximation \n')

    while( i <= imax)
        xr = (xl+xu)/2;

        f_r = f(xr);

        plotCondition = [1 2 4 6];

        y = ismember(i, plotCondition);

        if (enablePlot == 1 && y)
            x = [xl: 0.01: xu];
            z = [xl xr xu];
            fz = f(z);

            plot(x, f(x), z, fz, '*g');
        end

        fprintf (' %6.0f %18.8f \n', i, xr );

        if (f_r == 0 || ((xu-xl)/abs(xu+xl))< eps)
            root = xr;
            return
        end
        i = i+1;

        if (f_l*f_r < 0)
            xu = xr;
        else
            xl = xr;
            f_l = f_r;
```

```
        end
    end

    if enablePlot == 1
        hold off
    end

    fprintf ('failed to converge in %g iterations\n', imax)
end
```

Part c)

your_function M-file

```
type your_function.m
```

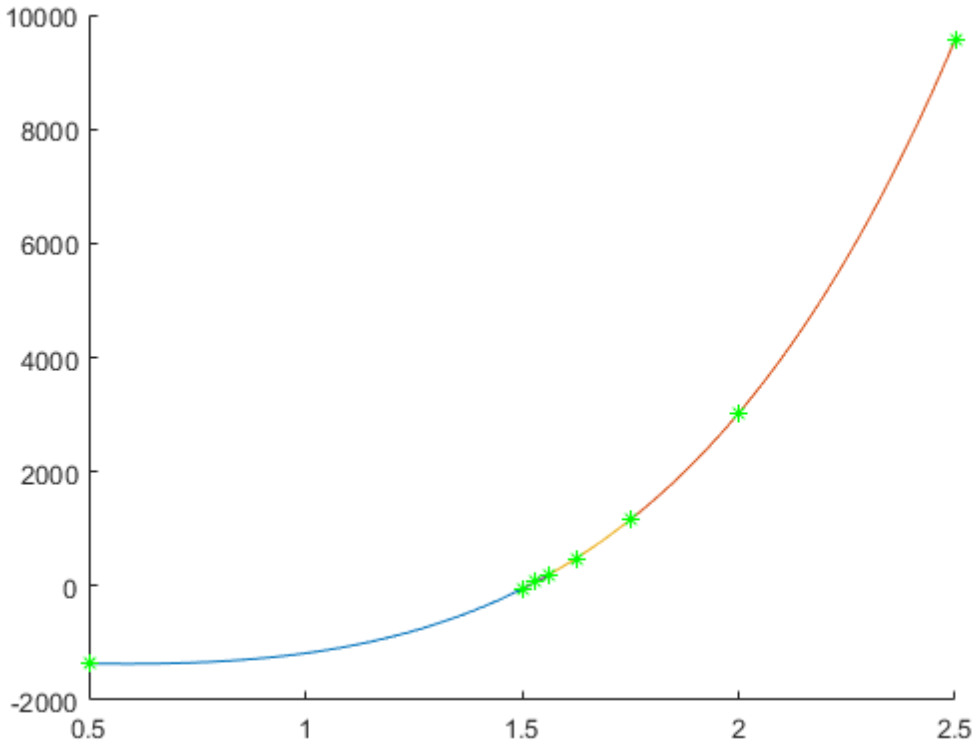
```
function y = your_function(x)
    g = 9.81;
    Q = 20;

    y = g*(3*x+x.^2/2).^3-Q^2*(3+x);
end
```

Bisect function call

```
Bisect(0.5, 2.5, 0.01, 10, @your_function, 1);
```

```
iteration approximation
      1         1.50000000
      2         2.00000000
      3         1.75000000
      4         1.62500000
      5         1.56250000
      6         1.53125000
      7         1.51562500
      8         1.50781250
```



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