

### Homework: Bisection Method

1. Write a function m-file for the bisection method with the following inputs:  $f$  as a string,  $a$  as the left endpoint of the interval,  $b$  as the right endpoint of the interval,  $x_{tol}$ , and  $y_{tol}$ . Also, have the option of not inputting  $x_{tol}$  and  $y_{tol}$ . If not input by the user in the workspace, let  $x_{tol} = 5\text{eps}$  and  $y_{tol} = 5\text{eps}$ .  $\text{eps}$  is Matlab's machine precision.
2. Test your file using the function  $y = 2x + 1$  with appropriate endpoints and without user defined  $x_{tol}$  and  $y_{tol}$ .
3. Modify your code so that the number of iterations is an output.
4. Test your file using the function  $y = 2x + 1$  with the endpoints  $a = -2$  and  $b = 0.45$  and without user defined  $x_{tol}$  and  $y_{tol}$ .