

Input: function $f(x)$, float a , float b , float tolerance , int max_n_iterations
Output: result table results

```
begin Bisection:
  if(f(x) is not valid function)
    break;
  if(a or b or tolerance or max_n_iterations are not valid numbers)
    break;
  if(tolerance < 0)
    break;
  if(iterations < 1)
    break;

  float f_a <- f(a)
  float f_b <- f(b)

  if(f_a * f_b is greater than or equal 0)
    break;

  array results

  float middle_point <- (a + b)/2
  float f_middle_point <- f(middle_point)
  float error <- MAXIMUM FLOAT VALUE
  int iterations_counter <- 1

  results[iterations_counter] <- [iterations_counter, a, middle_point, b,
  f_middle_point, "N/A"]

  float p_0

  while ((error > tolerance) and (iterations_counter < max_n_iterations))
    iterations_counter <- iterations_counter + 1
    if(f_a * f_b < 0):
      b <- middle_point
    else
      a <- middle_point

    p_0 <- middle_point
    middle_point <- (a + b)/2
    f_middle_point <- f(middle_point)
    error <- |middle_point - p_0|
    results[iterations_counter] <- [iterations_counter, a, middle_point,
    b, f_middle_point, error]
  end while
```

```
        return results
    end Bisection
```