

Input: function f(x), function df(x), function d2f(), float initial\_x ,  
float tolerance , int max\_n\_iterations

Output: result table results

```
begin MultipleRoots
  if(f(x) or df(x) or d2f(x) are not valid function)
    break;
  if(initial_x or tolerance or max_n_iterations are not valid number)
    break;
  if(tolerance < 0)
    break;
  if(iterations < 1)
    break;

  array results

  float previous_x <- initial_x
  float previous_f <- f(previous_x)
  float error <- MAXIMUM FLOAT VALUE
  int iterations_counter <- 0

  results[iterations_counter] <- [iterations_counter , previous_x ,
  previous_f , "N/A"]

  float current_x , current_f , previous_df , previous_d2f

  while ((error > tolerance) and (iterations_counter < max_n_iterations))
    iterations_counter <- iterations_counter + 1
    previous_df <- df(previous_x)
    previous_d2f <- d2f(previous_x)

    current_x <- previous_x - ((previous_f*previous_df)/
      (previous_df^2 - previous_f*previous_d2f))
    current_f <- f(current_x)
    error <- |current_x - previous_x|
    previous_x <- current_x
    previous_f <- current_f
    results[iterations_counter] <- [iterations_counter , previous_x ,
    previous_f , error]
  end while

  return results
end MultipleRoots
```