# Department of Computing

# MATH 333: Numerical Analysis

# Class: BSCS-8C

# Lab 5: Regular Falsi Method

# Date: March 2nd, 2022

# Time: 10:00 am-1:00 pm

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# Lab 5: Regular Falsi Method

**Introduction**

False position ( regula falsi ) method which is defined as a closed numerical method used for

find the roots of equations and polynomials.

**Objectives**

The purpose of this lab is to get familiar with Regular Falsi Method

**Tools/Software Requirement**

Matlab R2016a

**Description**

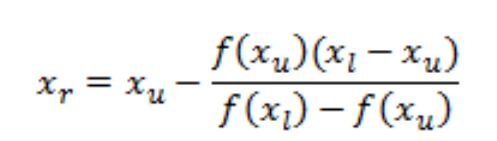
First of all, we need to predict a value for the roots (lower and upper guess)

* xl (xlower); lower guess
* xu (xupper); upper guess

For these two values of function f we will find;

* For xl f(xl)
* For xu f(xu)

Implement the following equation called as a false position formula:



**Pseudocode**

Start

2. Define function f(x)

3. Input

a. Lower and Upper guesses a and b

b. tolerable error e

4. If f(a)\*f(b) > 0

print "Incorrect initial guesses"

goto 3

End If

5. Do

Code the above mentioned equation to find the root and store it in variable c.

If f(a)\*f(c) < 0

b = c

Else

a = c

End If

while (fabs(f(c)) > e) // fabs -> returns absolute value

6. Print root as c

7. Stop

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(By using loop and understanding the algorithm, write the code and display the root. You can use a simple while loop instead of a do while loop as well)

**CODE:**

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| function c = false\_position()  % inputs function lower upper guess and tolerance  a=input('Enter function: ','s');  % To convert an input string to any number of function  f=inline(a);  xl=input('Enter lower guess:') ;  xu=input('Enter upper guess:');  tol=input('Enter tolerance(recommended 0.001):');  % Program will keep asking for correct inputs if the inputs are not correct  while true  if f(xu)\*f(xl)<0  break;  else  fprintf('Wrong Guess! Enter new guess\n');  xl = input('Enter Lower Guess:');  xu = input('Enter Upper Guess:');  end  end    for i=2:1000  % formula of false position  c = xu-(f(xu)\*(xl-xu))/(f(xl)-f(xu));  % setting the values for next iteration  if f(xl)\*f(c) <0  xu = c  else  xl = c  end  xnew(i)=c;  % if the asssigned values is less than tolerance, loop will break  if abs(f(c))<tol,break,end  end  str = ['The required root of the equation is: ', num2str(c), '']  end |

**OUTPUT:**

**Inputs entered**

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| **Graphical user interface, text  Description automatically generated** |

**Output recieved**

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| **Text  Description automatically generated** |

**Lab Task**

Implement Regular falsi method as function. Take function, initial guess, tolerance and other required parameter as input from user. find its roots.

**Deliverables**

Submit single word file with matlab code and screen shot of Output.