

IDC101 (Introduction to Computation) :

Lab Exercise 7 :

General Instruction :

For each problem given here, first decide your algorithm. That is, first decide how you will solve the problem on paper. Only after this, you should start writing your program. Preferably, write a flow-chart and then write the program.

Here's the checklist :

- a) *Read the problem carefully. Decide the inputs required.*
- b) *Decide your step-by-step algorithm. That is, decide how you will solve your problem step-by-step.*
- c) *Now, write your program following your algorithm.*

A sample algorithm is given for problem 2 in page 2.

1. Given a function $x^2 + 2.1x = 8.82$

how you will determine if the function is monotonically increasing or decreasing in a given interval [a,b]. This does not require any python or programming.

2. Write a program using bisection method to find roots in the interval [0,4] for the equation,

$$x^2 + 2.1x = 8.82$$

The root should be correct to 3 decimal places. A sample flowchart is given for bisection method in the next page.

3. For the problem given above, use the program you had already written to find the roots in the interval [-5,-3].

4. Use the Newton-Raphson method to find one root of the equation

$$f(x) = x^3 - x - 1$$

correct to 5 decimal places. First, write a flowchart for Newton-Raphson

method before solving this problem.

Flow-Chart for finding roots of a function by Bisection method

