Theoretical Models for Computing

Lab #4

Instructor: Dr. Ha Viet Uyen Synh.

1. Develop a program using a programming to implement the Newton's algorithm. Design the program so that it is expressly designed to locate a maximum and selects new points as in.

$f(x) = 4x - 1.8x^2 + 1.2x^3 - 0.3x^4$

The subroutine should have the following features:

• Iterate until the relative error falls below a stopping criterion or exceeds a maximum number of iterations.

• Return both the optimal x and f (x).

2. Find the minimum value of

$f(x, y) = (x - 3)^2 + (y - 2)^2$

starting at x = 1 and y = 1, using the steepest descent method with a stopping criterion of $\varepsilon_s = 1\%$.