

CHAPTER I

INTRODUCTION

1.1 Background

Polynomial is one of the functions in mathematics which involves multiplying, exponent and value of the variable. Here is a general form of a polynomial:

$$f(x) = a_n x^n + a_{n-1} x^{n-1} + a_{n-2} x^{n-2} + \dots + a_0$$

To complete the function, we need to search their root of the function, the x value which have a value of the function $f(x) = 0$. There are several ways that used to solve polynomial function. However, the problems arise when find the value of a variable or root of function with the highest exponent 3 or more because it requires a particular method for finding the root of the function.

This project will use Particle Swarm Optimization algorithm to find the root of function optimally for every rank of polynomial. This algorithm is one of the optimization algorithms used to find the most optimal solution. This algorithm uses real numbers to perform the optimization process. Particle Swarm Optimization imitate animals such as fish and birds flocking in finding their food. This algorithm is expected to search the root of the function or the value of a variable with a function value that are most optimal or close to the desired result.

1.2 Scope

There are the scope of this project:

1. This project will use the Java Language
2. This project will use Particle Swarm Optimization Algorithm
3. This project only solving the 1 dimension of polynomial
4. This project will use the 2 dimension Array for data structure

1.1 Objective

The purpose of this project is to implement the particle swarm algorithm for solving the polynomial equations, which is looking for the root of function optimally.

