Report Assignment 1

Name = Puruso Muhammad Hanunggul

Class = IF-39-INT

NIM = 1301153680

**Problem Description (Case Study)**

We have to solve the equation of function problem

Which is and

The problem is we have to find the minimum value its function using Simulated Annealing algorithm to determine what is the value of and . As we know, Simulated Annealing is one of Heuristic Searching Method which utilizes the analogy of cooling and freezing metal into a crystal. In this case, we didn’t know the goal state, so the program will repeat until a certain times that has been specified by programmer to find the best so far.

**Method and Design**

This program is using three (3) methods. The first method is “codeA” function. This function will contain a several double variable which is a part of the formula equation. The return value is value.

The second method is “randomNumber” function. This method will generate random real number between -10 until 10 to obtain the value of and. The last method is “randomProbabilty” function which is generate random real number between 0 until 1 to obtain the probability for accepting the new state.

The program work start from initial current state as best so far, after that, do loopin until a certain times. In here, the program will loop until 1000 times. Inside the looping, program will generating new random number by calling method “randomNumber” to obtain the value of and . Both of those value will be as the parameter of “codeA” function that will be initial as new state. Next step is find the Delta Energy () by decreasing the new state with current state. If is below than 0, then set the new state as current state and also set it as best so far. Else, the program declare T value as temperature base on . After that, define the probability using the formula:

After get the probability, the program will call “randomProbability” to determine whether the probability is accepted or not. If accepted, the new state will set as new current state and go back to the beginning of looping.

The final result of best so far is ranged between -0,01 until -0,99. Sometimes the program will has best so far around 2 until 3 caused by the accepted probability.

**Output Result**

