CHAPTER III

RESEARCH METHODOLOGY

The planning steps in this project are :

1. Analysis

The first step in this project is to analyze what data that needed in security guard scheduling, such as security guards, point guards, shifts, and constraints. The objective is to make the schedule by using genetic algorithm.

2. Make the Program Design

The next step is to create a program design based on the data from step one. Program design consist of input user, then the input will be processes using genetic algorithm, and finally the output will be displayed in the GUI. Input user data is obtainable from the input form in the GUI such as security's name, gender, point guard, and start working hours. From the data, the genetic algorithm will generate on a population of solutions rather than a single solution. And then the fitness values from each solution will be counted. Fitness value is a number that declare the quality of individual. After that, there will be a selection using roulette wheel method. This selection is to choose individual with the optimum fitness value. The next process called crossover. Crossover will combine one individual with another random individual. Then, the solution will be mutated. And the mutation will randomize the value of the gen.

After all of those processes, there will be formed many new individuals. These new individual fitness value will be counted too, and if the values aren't qualified yet, then the processes will be repeated again until it gets the optimum fitness value. Then the output schedule will be displayed in the GUI.

3. Implementation

After all those steps, the program is ready to be created based on Java programming language and using genetic algorithm. This step include making the coding and to display this program is using GUI. After finished making the program, then it's needed to be tested. Try to run the program to get the result and check if there is an error or not.

4. Make a Report

The last step, is to make the project report. Project report contain what data from input user from GUI, the processes to search the optimum data, until the result that will be displayed in GUI. The result is a schedule that consist of working day, name of the security, gender of the security, and the point guard.