

# CHAPTER 1

## INTRODUCTION

### 1.1 Background

House is very influential towards life style. To build a house floor plan is needed. The optimal rooms are follows by several things: temperature, humidity, ventilation, density, lighting, garbage disposal, human waste disposal, and also water supply (Azwar, 1990). The optimal floor plan is an effective ways to reduce cost and should improve productivity, and if the layout is optimal then house will good to be occupied. The better location of the usability of the room will be more optimal.

Genetic algorithm is an algorithm to get optimal solution with many combinations by mimicking the concept of natural evolution. Genetic algorithms are used to find the optimal solution to solve a problem. The genetic algorithm begins by encoding the initial chromosomes, creating an initial population, evaluating the fitness value, and forming a new chromosome. To find the optimal solution, this algorithm do several repetition of initializing population, evaluating fitness value, and the formation of new chromosome process and compare the solution obtained. The solution taken is the solution with the highest fitness value(Goldberg, 1989).

Genetic algorithm has several advantages. First it has a good balance of the search process, which means the algorithm will explore an efficient solution that has never been traced out of the entire space provided, so the solution may be less able to decide on a relative maximum number. Second genetic algorithms have no effect on the circumstances in which disconnected spatial solutions, since problems are mathematically derived from uncertain day-to-day lives. The creator does not need to create complex method to solve a problem. Genetic algorithm the solution obtained this algorithm using the best solution has been obtained (Arnawan, 2010).

With the logic of Genetic algorithm, the arrangement of the floor plan will be arranged so that the location of the room is optimal according to its function (Anna de Almeda,

2014). Genetic Algorithm in the search process, genetic algorithms can find solution in various ways and can be used with several different methods.

## 1.2 Scope

This project is built on Java Programming Language by implementing Genetic Algorithm. The data to create the optimal room design is defined by user input. This project is focused on implementation of Genetic algorithm to resolve the problems below:

1. How to impelement Genetic algorithm to produce optimal floor plan?
2. How the difference in the number and size of the room influence Genetic algorithn performace?
3. How to find the right floor plan, if the house has two levels?

## 1.3 Objective

The goal of this project is to facilitate the arrangement of rooms in accordance with optimal solution of floor plan using Genetic algorithm with the use of the room as the criteria.

