IMPLEMENTATION OF BEE COLONY OPTIMIZATION ALGORITHM FOR JOB SHOP SCHEDULING

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Abstract
Scheduling is a common problem in manufacturing companies. One of the most important task in is how to improve the utility engine and time reduction of a product cycle. Hence, job shop scheduling is one of the most important task to get most optimal solution. Job shop scheduling problem is one of combinatorial optimization problems which has very complicated non-deterministic polynomial time (NP-complete). Various methods have been developed to solve this problem, yet there are several methods which has less performance. Bee colony is one of the method that can solve this problem.

In the implementation of this final project, bee colony optimization will be applied to solve Job Shop scheduling problem. Bee colony optimization is a heuristic algorithm that belongs to the intelegent swarm algorithm. This optimization algorithm’s process algorithm is like the behavior of bees in search of food sources. Two main characteristics are presented in this optimization, are forage and the waggle dance. With these characteristics, scheduling problems that belongs to this combinatorial problem could get the optimal solution.

In the end of this final task, the results that will be displayed is the solution of job shop scheduling problem using bee colony
optimization algorithm and will be compared with the Particle Swarm Optimization algorithm (PSO) modification.

**Key words:** scheduling, optimization, job shop scheduling, bee colony optimization.