Abstract In this paper,aiming at the multi-skill resource-constrained project scheduling problem(MSRCPSP),considering the experience of human resource increasing and the improved efficinency of executing activity of project with the project executing,we propose a mathematical modal considering the

1 Introduction

The resource-constrained project scheduling problem (RCPSP)is one of the most widely studied scheduling problems,the goal is to find an optimal resource-activity schedule to minimize the cost and the makespan of project . The RCPSP problem is a NP-hard problem for combinatorial optimization, and researchers are encouraged to find good enough methods to generate an approximate optimal solution in a finite polynomial calculation time [1].

The multi-skill resource constrained project scheduling problem (MSRCPSP) is an extension of RCPSP by skills domain [2]. In the MSRCPSP problem, each resource has several skills at a certain level of proficiency, and each task requires given skill in specified familiarity level. This type of problem has many application scenarios, which can typically applied to human resource scheduling. For example, it requires employees with different skills to carry out development work in software engineering projects [3], each employee has different type of skills with different proficiency. Such as a database design, programming, testing, etc. The project consists of a number of tasks, each of which needs to be performed by an employee who meets the skill level requirements. In order to complete the project as early as possible, the project manager needs to assign each task to the performer and coordinate the execution order of each task.