Intelligent Staff Scheduling: Optimizing the Solver with Tabu Search

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Abstract : Traditional staff scheduling methods, relying on employee experience, often lead to inefficiencies and resource waste. The challenges of transferring scheduling expertise and adapting to changing labor regulations further complicate this process. Manual approaches become increasingly impractical as companies accumulate complex scheduling rules over time. This study proposes an algorithmic optimization approach to address these issues, aiming to expedite scheduling while ensuring strict compliance with labor regulations and company policies. The method focuses on generating optimal schedules that minimize weighted company objectives within a compressed timeframe. Recognizing the limitations of conventional commercial software in modeling and solving complex real-world scheduling problems efficiently, this research employs Tabu Search with both long-term and short-term memory structures. The study will present numerical results and managerial insights to demonstrate the effectiveness of this approach in achieving intelligent and efficient staff scheduling.