

## Assignment 7 Presentation Slides: Branch-and-Bound Method

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**Slide 1: Title** - Assignment 7: Production Scheduling - Method Chosen: Branch-and-Bound - Student: Huang Jiahui (44251017)

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**Slide 2: Why I Chose Branch-and-Bound** - Guarantees optimal solution - Systematically prunes unpromising paths - Uses upper and lower bounds to reduce search - Visually structured through a search tree - Mathematically elegant approach

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**Slide 3: Difficulties in Application** - Rapid growth of search tree with more jobs (factorial complexity) - High computational cost for large problems - Lower bound calculation is complex and time-consuming - Managing and evaluating partial solutions efficiently is challenging

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**Slide 4: How to Improve for Large Problems** - Apply heuristic rules to get good initial upper bounds - Use priority rules or best-first search - Implement parallel processing - Combine with metaheuristics like local search or genetic algorithms

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**Slide 5: Summary** - Branch-and-bound is effective for exact solutions - Best for problems where quality is critical - Needs enhancements to scale to industrial-size problems - Future potential: hybrid and parallel optimization