

Job Shop Scheduling

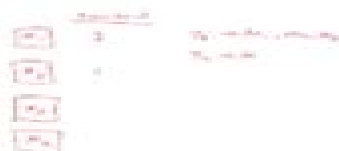
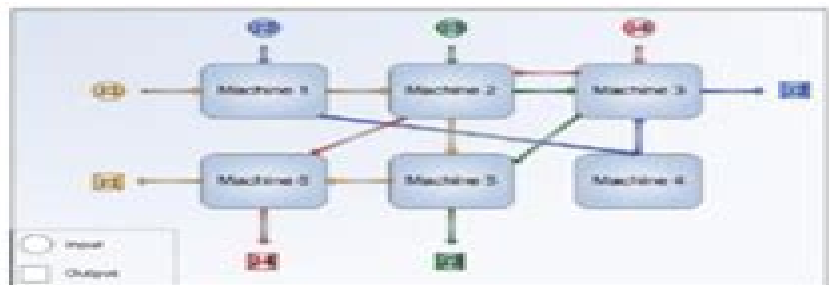
Job Shop Scheduling

The job-shop scheduling problem is the scheduling problem of jobs that can follow different routes from each other in a system consisting of n jobs in machines.

■ For example, in a system consisting of 4 jobs and 6 machines given below, J1 job is processing on route M1-M2-M5-M6 respectively. While processing on machines numbered; Job J3 is processed on machines numbered M2-M3-M5. Also, other two jobs (J2 and J4) follow different routes.

■ In this example, jobs go through the same number of operations (each running on a total of three machines) except to J1. The point to note is the number of operations that need to be processed for each job may also be different as J1.

■ Routes of jobs and processing times for each machine are known in advance.



Handwritten note: "J1, J2, J3, J4" followed by "J1, J2, J3, J4"

Constraintdirected Search A Case Study Of Jobshop Scheduling

IFIP WG 8.3



Constraintdirected Search A Case Study Of Jobshop Scheduling:

Constraint-directed Search Mark Fox,1987 **Constraint-directed Search** Mark S. Fox,1983 This thesis investigates the problem of constraint directed reasoning in the job shop scheduling domain The job shop scheduling problem is defined as selecting a sequence of operations whose execution results in the completion of an order and assigning times i e start and end times and resources to each operation The number of possible schedules grows exponentially with the number of orders alternative production plans substitutable resources and possible times to assign resources and perform operations The acceptability of a particular schedule depends not only on the availability of alternatives but on other knowledge such as organizational goals physical limitations of resources causal restrictions amongst resources and operations availability of resources and preferences amongst alternatives By viewing the scheduling problem from a constraint directed search perspective much of this knowledge can be viewed as constraints on the schedule generation and selection process In this thesis we present a system called ISIS ISIS uses a constraint directed search paradigm to solve the scheduling problem ISIS provides a knowledge representation language SRL for modeling organizations and their constraints hierarchical constraint directed scheduling of orders which includes constraint directed bounding of the solution space context sensitive selection of constraints and weighted interpretation of constraints analytic and generative constraint relaxation and techniques for the diagnosis of poor schedules *Principles and Practice of Constraint Programming - CP97* Gert Smolka,1997-10-15 This book constitutes the refereed proceedings of the Third International Conference on Principles and Practice of Constraint Programming CP 97 held in Linz Austria in October November 1997 The volume presents 37 revised full papers carefully selected from a total of 132 submissions also included are the abstracts of two invited talks and three tutorials The papers address all current aspects of constraint programming Among the topics covered are constraint matching constraint languages set constraints constraint search constraint satisfaction problems scheduling constraint routing temporal constraints constraint graphs local search object oriented constraint programming etc **Combinatorial Optimization Problems in Planning and Decision Making** Michael Z. Zgurovsky,Alexander A. Pavlov,2018-09-24 The book focuses on the next fields of computer science combinatorial optimization scheduling theory decision theory and computer aided production management systems It also offers a quick introduction into the theory of PSC algorithms which are a new class of efficient methods for intractable problems of combinatorial optimization A PSC algorithm is an algorithm which includes sufficient conditions of a feasible solution optimality for which their checking can be implemented only at the stage of a feasible solution construction and this construction is carried out by a polynomial algorithm the first polynomial component of the PSC algorithm an approximation algorithm with polynomial complexity the second polynomial component of the PSC algorithm also for NP hard combinatorial optimization problems an exact subalgorithm if sufficient conditions were found fulfilment of which during the algorithm execution turns it into a polynomial complexity algorithm Practitioners and software

developers will find the book useful for implementing advanced methods of production organization in the fields of planning including operative planning and decision making Scientists graduate and master students or system engineers who are interested in problems of combinatorial optimization decision making with poorly formalized overall goals or a multiple regression construction will benefit from this book *Principles and Practice of Constraint Programming* Gilles Pesant,2015-08-12 This book constitutes the refereed conference proceedings of the 21st International Conference on Principles and Practice of Constraint Programming CP 2015 held in Cork Ireland in August September 2015 This edition of the conference was part of George Boole 200 a celebration of the life and work of George Boole who was born in 1815 and worked at the University College of Cork It was also co located with the 31st International Conference on Logic Programming ICLP 2015 The 48 revised papers presented together with 3 invited talks and 16 abstract papers were carefully selected from numerous submissions The scope of CP 2014 includes all aspects of computing with constraints including theory algorithms environments languages models systems and applications such as decision making resource allocation scheduling configuration and planning **Principles and Practice of Constraint Programming** Thomas Schiex,Simon de Givry,2019-09-23 This book constitutes the proceedings of the 25th International Conference on Principles and Practice of Constraint Programming CP 2019 held in Stamford CT USA France in September October 2019 The 44 full papers presented in this volume were carefully reviewed and selected from 118 submissions They deal with all aspects of computing with constraints including theory algorithms environments languages models systems and applications such as decision making resource allocation scheduling configuration and planning The papers were organized according to the following topics tracks technical track application track multi agent and parallel CP track testing and verification track CP and data science track computational sustainability and CP and life sciences track **Knowledge-Based Systems, Four-Volume Set** Cornelius T. Leondes,2000-07-11 The design of knowledge systems is finding myriad applications from corporate databases to general decision support in areas as diverse as engineering manufacturing and other industrial processes medicine business and economics In engineering for example knowledge bases can be utilized for reliable electric power system operation In medicine they support complex diagnoses while in business they inform the process of strategic planning Programmed securities trading and the defeat of chess champion Kasparov by IBM s Big Blue are two familiar examples of dedicated knowledge bases in combination with an expert system for decision making With volumes covering Implementation Optimization Computer Techniques and Systems and Applications this comprehensive set constitutes a unique reference source for students practitioners and researchers in computer science engineering and the broad range of applications areas for knowledge based systems **Optimization: Techniques And Applications (Icota '95)** G Z Liu,1995-09-01 With the advent of powerful computers and novel mathematical programming techniques the multidisciplinary field of optimization has advanced to the stage that quite complicated systems can be addressed The conference was organized to provide a

platform for the exchange of new ideas and information and for identifying needs for future research The contributions covered both theoretical techniques and a rich variety of case studies to which optimization can be usefully applied

Principles and Practice of Constraint Programming, 1997 Artificial Intelligence in Agriculture Alexander J. Udink ten Cate, 1995 Paperback The second IFAC IFIP Eur Ag Eng workshop on AI in agriculture provided a forum for the presentation of new research development and applications of AI in agriculture The workshop brought together leading researchers and practitioners both academic and industrial and enabled them to discuss and evaluate new and exciting bridges between AI and its applications in agriculture and domains connected to it in particular environmental sciences This publication contains the papers covering a wide range of topics presented at the workshop **IJCAI-93** International Joint Conferences on Artificial Intelligence, 1993 **Proceedings**, 1995 *Designing Expert Systems* Paul J. Kline, Steven B. Dolins, 1989-08 Until now there has been a lack of published information on how to design expert systems This book provides practical guidelines to assist expert systems builders in choosing the right system design and the right artificial intelligence techniques to solve real life design problems Presents a wealth of powerful techniques the problems they solve and includes tips and tricks for using them to best effect **Biomedical Technology & Human Factors Engineering**, 1984

ASPRS/ACSM/RT 92 Technical Papers American Society for Photogrammetry and Remote Sensing, 1992 Washington D C August 3 8 1992 Covers **Knowledge Representation for Decision Support Systems** IFIP WG 8.3, 1985 *Logic Programming* Christoph Beierle, Lutz Plümer, 1995 This text aims at promoting a convergence between the technical challenges of developing advanced software systems and the formal techniques tools and features evolving from the logic programming paradigm It provides contributions towards different aspects of logic programming **Advances in Optimization and Approximation** Ding-Zhu Du, Jie Sun, 1994-05-31 This book is a collection of research papers in optimization and approximation dedicated to Professor Minyi Yue of the Institute of Applied Mathematics Beijing China The papers provide a broad spectrum of research on optimization problems including scheduling location assignment linear and nonlinear programming problems as well as problems in molecular biology The emphasis of the book is on algorithmic aspects of research work in optimization Special attention is paid to approximation algorithms including heuristics for combinatorial approximation problems approximation algorithms for global optimization problems and applications of approximations in real problems The work provides the state of the art for researchers in mathematical programming operations research theoretical computer science and applied mathematics *Expert Systems in Business and Finance* Lance B. Eliot, 1993-07-27 Articles written by foremost experts in their respective fields consider four major issues crucial for successful utilization of the technology in the research development and implementation phases Coverage includes areas of integration and design the cognitive side of expert systems key concepts and applications underlying verification validation auditability and security of expert systems a variety of issues ranging from legal and training to actual production systems in

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