

1. Record Nr.	UNINA9910779692703321
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Titolo	Algorithmics of matching under preferences // David F. Manlove, University of Glasgow, UK ; with a foreword by Kurt Mehlhorn
Pubbl/distr/stampa	[Hackensack] N.J., : World Scientific, c2013 New Jersey : , : World Scientific, , [2013] 2013
ISBN	1-299-46251-0 981-4425-25-7
Descrizione fisica	1 online resource (xxxi, 491 pages)
Collana	Series on theoretical computer science, , 1793-849X ; ; v. 2
Disciplina	005.1
Soggetti	Matching theory Marriage theorem Computer science - Mathematics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Preface; Foreword; Acknowledgments; Contents; List of Figures; List of Tables; List of Algorithms; 1. Preliminary definitions, results and motivation; 1.1 Introduction; 1.1.1 Remit of this book; 1.1.1.1 Matching under preferences; 1.1.1.2 Free-for-all markets; 1.1.1.3 Centralised matching schemes; 1.1.2 The matching problems under consideration; 1.1.2.1 Classification of matching problems; 1.1.2.2 Bipartite matching problems with two-sided preferences; 1.1.2.3 Bipartite matching problems with one-sided preferences; 1.1.2.4 Non-bipartite matching problems with preferences 1.1.2.5 Further problem variants1.1.3 Existing literature on matching problems; 1.1.3.1 Algorithms and complexity literature; 1.1.3.2 Game theory and economics literature; 1.1.3.3 Algorithmic mechanism design literature; 1.1.4 Contribution of this book; 1.1.4.1 General overview; 1.1.4.2 Chapter outline; 1.1.4.3 What the book does not contribute; 1.1.5 Outline of this chapter; 1.2 Matchings in graphs; 1.3 The Hospitals / Residents problem (hr); 1.3.1 Introduction; 1.3.2 Key definitions; 1.3.3 Key results (up to 1989); 1.3.4 Stable Marriage problem (sm); 1.3.4.1 Key definitions

1.3.4.2 Key results (up to 1989) 1.3.4.3 Rotations; 1.3.5 Hospitals / Residents problem with indifference; 1.3.6 Other variants of hr; 1.3.6.1 Couples; 1.3.6.2 Many-many stable matchings; 1.3.6.3 Master lists; 1.3.7 Motivation; 1.4 The Stable Roommates problem (sr); 1.4.1 Introduction; 1.4.2 Key definitions; 1.4.3 Key results (up to 1989); 1.4.4 Rotations; 1.4.5 Stable Roommates problem with indifference; 1.4.6 Motivation; 1.5 The House Allocation problem (ha) and its variants; 1.5.1 Introduction; 1.5.2 Formal definition of ha and hm; 1.5.3 Pareto optimal matchings 1.5.4 Maximum utility matchings 1.5.5 Popular matchings; 1.5.6 Profile-based optimal matchings; 1.5.7 Extensions of ha; 1.5.8 Motivation; Stable Matching Problems; 2. The Stable Marriage problem: An update; 2.1 Introduction; 2.2 The 12 open problems of Gusfield and Irving; 2.2.1 Introduction; 2.2.2 1. Maximum number of stable matchings; 2.2.3 2. The "divorce digraph"; 2.2.4 3. Parallel algorithms for stable marriage; 2.2.5 4. Batch stability testing; 2.2.6 5. Structure of stable marriage with ties; 2.2.7 6. Sex-equal matching; 2.2.8 7. Lying and egalitarian matchings 2.2.9 10. Succinct certificates 2.2.10 11. Algorithmic improvements; 2.3 The Subramanian and Feder papers; 2.3.1 Subramanian: sri and network stability; 2.3.2 Feder: sri and 2-sat; 2.3.3 Other fixed-point approaches; 2.4 Linear programming approaches; 2.5 Constraint programming approaches; 2.5.1 Introduction; 2.5.2 Preliminaries; 2.5.3 Overview of the csp model; 2.5.4 Arc consistency in the csp model; 2.6 Paths to stability; 2.6.1 Introduction; 2.6.2 The Roth-Vande Vate Mechanism; 2.6.3 The Random Order Mechanism; 2.6.4 Other decentralised algorithms; 2.7 Median stable matchings 2.8 Size versus stability

## Sommario/riassunto

Matching problems with preferences are all around us - they arise when agents seek to be allocated to one another on the basis of ranked preferences over potential outcomes. Efficient algorithms are needed for producing matchings that optimise the satisfaction of the agents according to their preference lists. In recent years there has been a sharp increase in the study of algorithmic aspects of matching problems with preferences, partly reflecting the growing number of applications of these problems worldwide. This book describes the most important results in this area, providing a timely update