

Preface

The Kolkata Restaurant Problem or more specifically the Kolkata Paise Restaurant (KPR) problem is a repetitive many-choice and many-agent game where the players collectively learn from past experience, and the identification of successful strategies help to avoid the crowd in order to grab the best (minority choice) opportunity available. Although the binary-choice many-agent games, called minority games, have been studied earlier, these many-choice games have many dimensions, and the successful strategies here can have intriguing features. Detailed studies on several stochastic strategies, which ensure maximum utilization of the resources, have been made. These are mostly classical (using statistical physics tricks). Quantum strategies are also being formulated with interesting features. This book intends to give an introduction on this recent development.

Along with the main text on these interdisciplinary developments, we have included six appendices for the benefit of the readers. Five of them are invited contributions from our colleagues: *Statistical Physics: A Brief Introduction* by Purusattam Ray (Institute of Mathematical Sciences, Chennai), *Quantum Mechanics: A Brief Introduction* by Parthasarathi Mitra (Saha Institute of Nuclear Physics, Kolkata), *Game Theory (Classical): A Brief Introduction* by Priyodorshi Banerjee (Indian Statistical Institute, Kolkata), Manipushpak Mitra (Indian Statistical Institute, Kolkata) and Conan Mukherjee (Lund University, Lund, Indian Institute of Technology Bombay, Mumbai), *Minority Game: An Overview and Recent Results* by V. Sasidevan (Frankfurt Institute for Advanced Studies, Frankfurt), and *Extending KPR Problem to Dynamic Matching in Mobility Markets* by Layla Martin and Paul Karaenke (Technical University of Munich, Munich). We are extremely thankful for their contributions to this volume. Another appendix on *Econophysics: A Brief Introduction* has also been added by us. Each chapter, including of course the appendices, contains sufficient introductory materials, with references to other chapters or appendices for details, so that the reader can choose each chapter almost independently.

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This book is addressed to students and researchers in economics (game theory and model games), physics (statistical physics, quantum mechanics), and computer science (job scheduling, etc). We hope they will find material here sufficiently exciting and useful for inspiring researches in these directions.

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Econophysics of the Kolkata Restaurant Problem and
Related Games

Classical and Quantum Strategies for Multi-agent,
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