

STRUCTURE OF FCFS INFINITE MATCHING

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We consider two random infinite sequences of items, each consisting of several types, with a bipartite compatibility graph of allowed matches, and investigate FCFS (first come first served) matching of the two sequences. This model is a great simplification of service systems with skill based routing, but it captures many important features. It is also relevant to organ transplants, stock exchange buy and sell bids, and cloud computing. This seemingly intractable model has in fact an embarrassingly simple structure. We define a Markov chain that describes the evolution of the matching process, show that it is reversible and has simple Bernoulli product form steady state distribution, and list various performance measures that can be calculated.