

Queuing Network Models

Introduction

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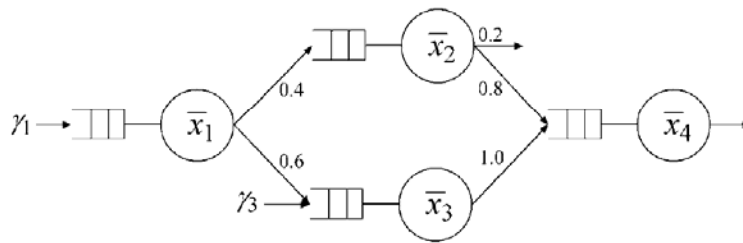
Introduction

- Consist of a network of service facilities
- Customers move from one service facility to another according to transition (routing) probabilities
- Useful for modeling sequential use of resources by the same customer
- Types of queuing networks
 - open network
 - closed network
 - mixed network
 - network with population size constraints

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Open Network

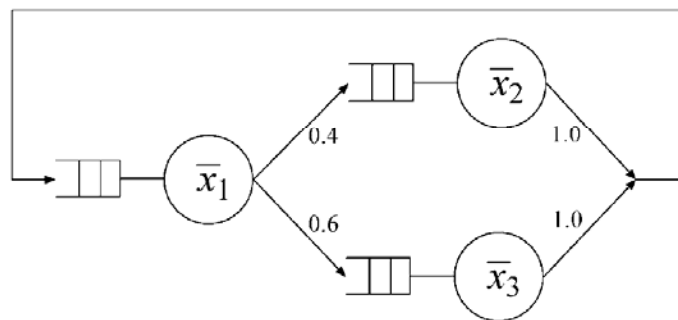
- Customers can enter or leave the network
- No. of customers in network is a random variable



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Closed Network

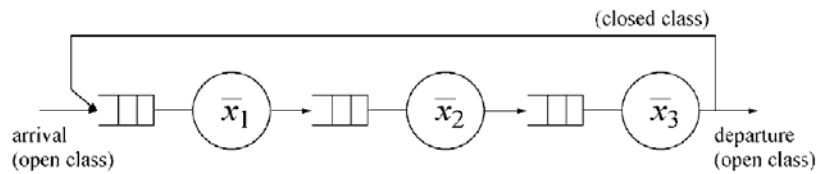
- Customers can neither enter nor leave the network
- Total no. of customers in network is constant



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Mixed Network

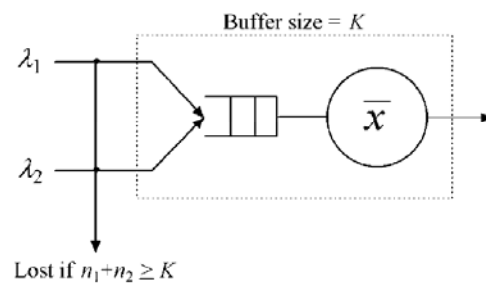
- Network is open for some customer classes, but closed for the others



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Network with Population Size Constraints

- No. of customers in network must satisfy some pre-specified constraints
- λ_i - arrival rate of class i customers
- n_i - number of class i customers in system



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