

Queueing Theory

Optimising your weekly shop

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What is a Queue?

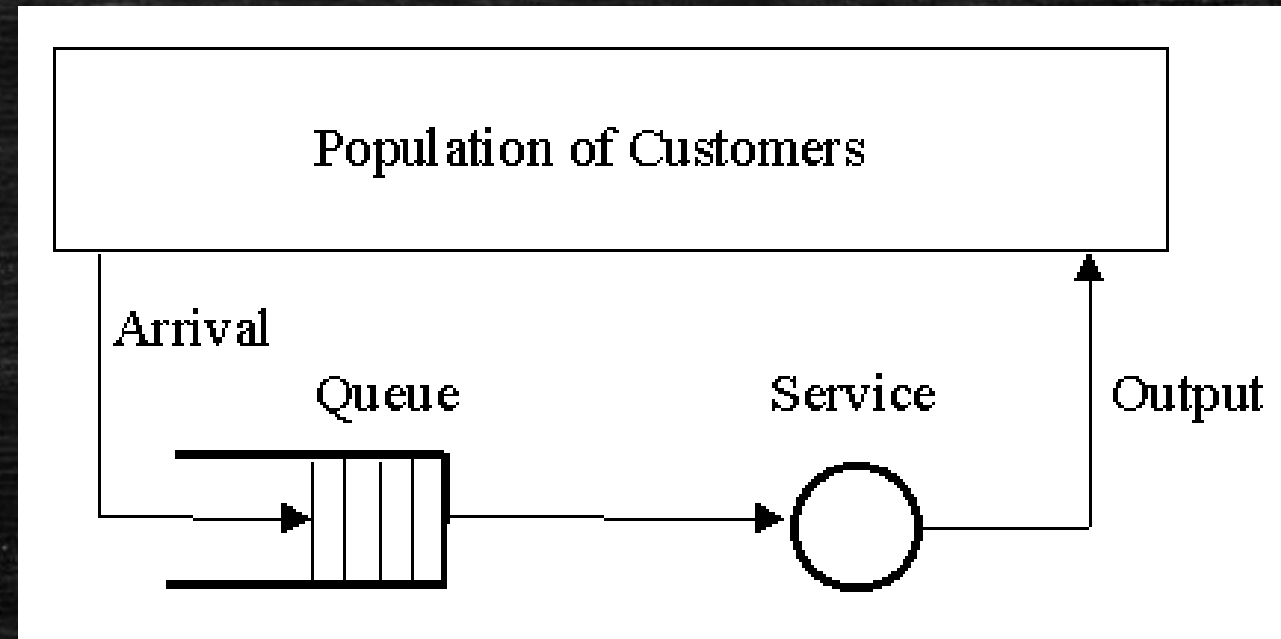


<https://www.google.co.uk/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&cad=rja&uact=8&ved=0ahUKEwj1-LyWgMjYAhWLa1AKHdoXBm8QjRwIBw&url=http%3A%2F%2Fwww.mirror.co.uk%2Fnews%2Fuk-news%2Fsupermarket-fastest-queues-revealed-chain-9725720&psig=AOvVaw3nlbqsDHIJ5336MPqgXE0o&ust=1515519474478073>

Queue Model

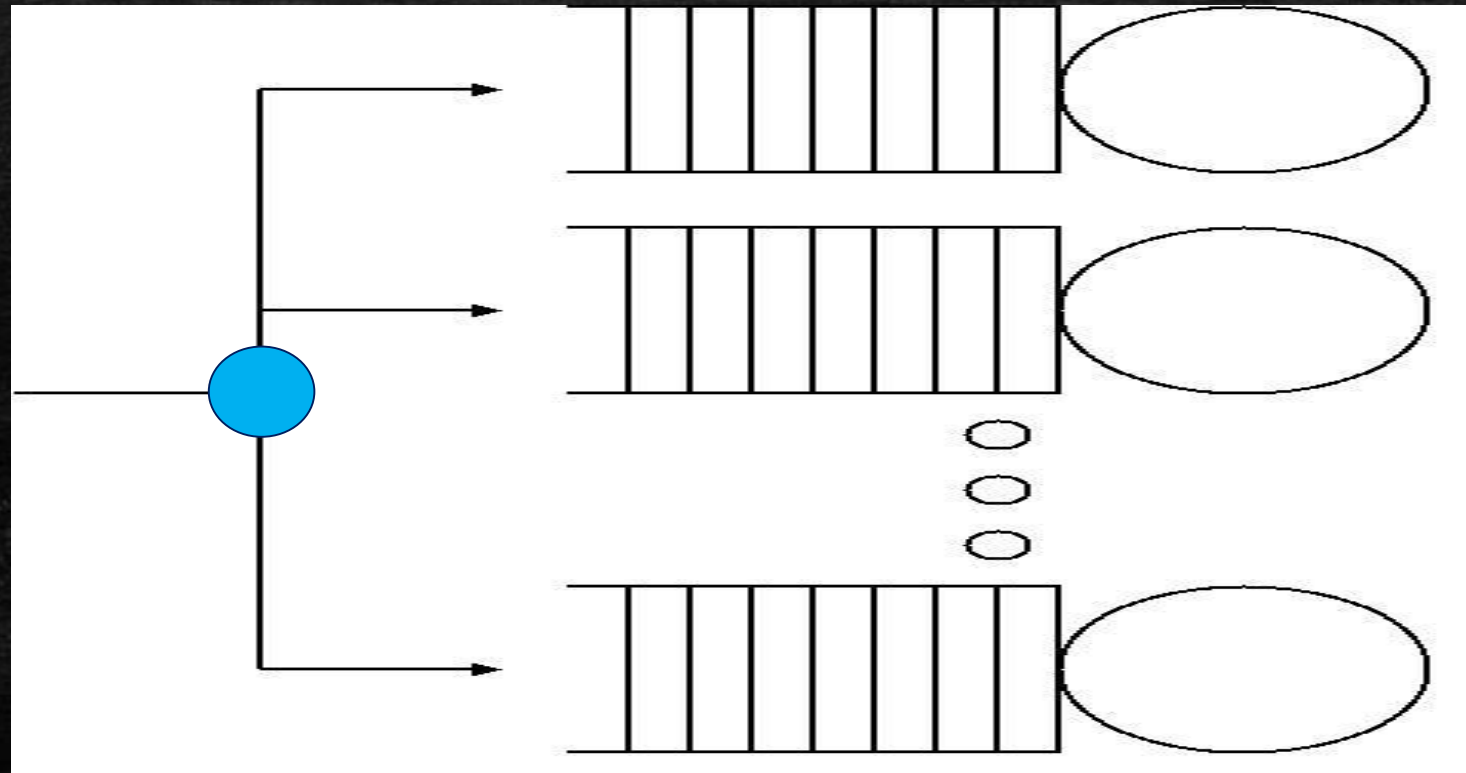
- Inter-Arrival Time Distribution (A)
- Service Time Distribution (B)
- Number of Servers (c)
- Scheduling Policy (FCFS)
- Capacity (∞)

A/B/c



Modelling Assumptions – the M/M/c Queue

- M - Markov Property
- c - Number of Cashiers (known)

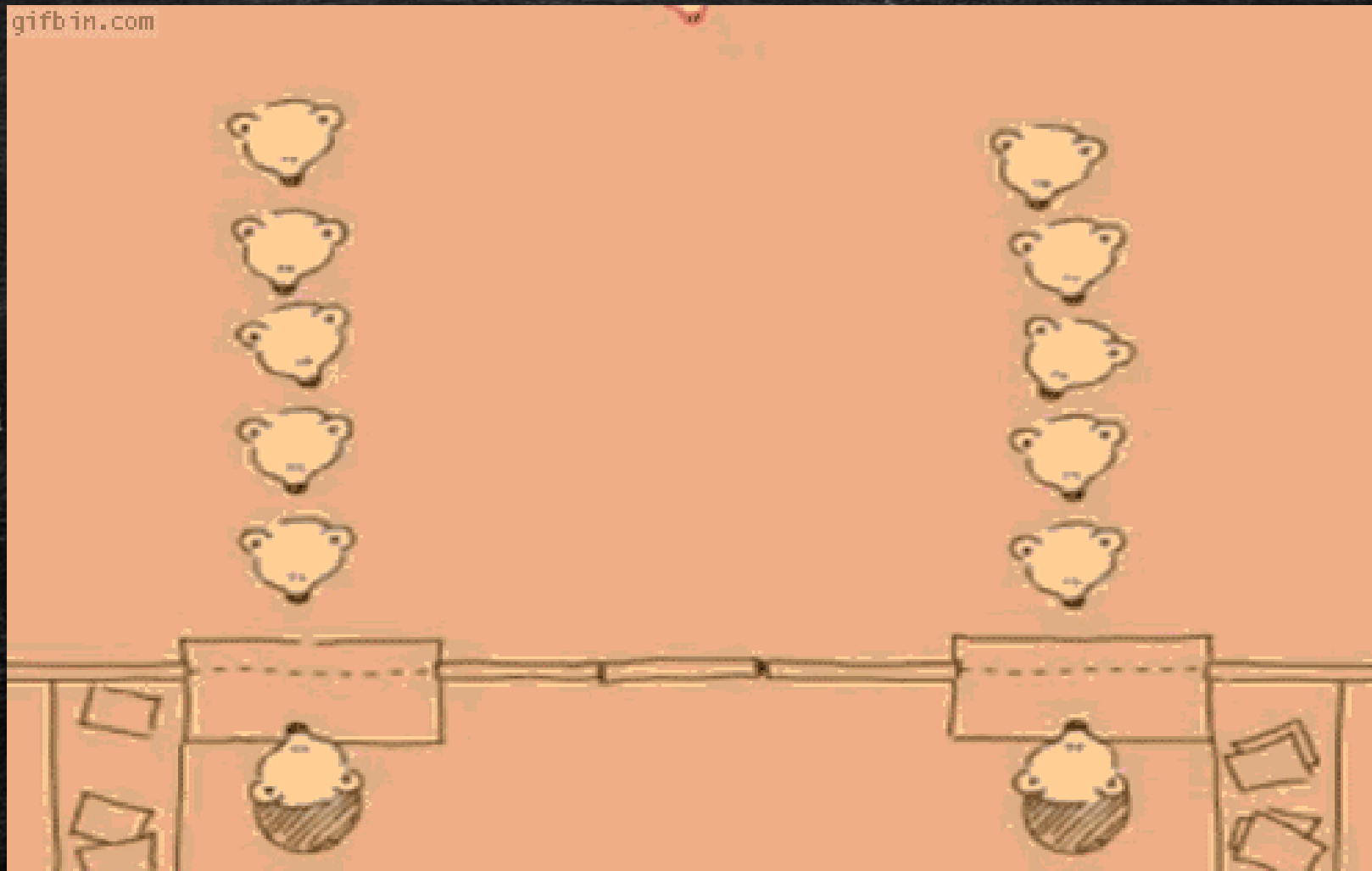


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Load Balancing Policies

- Supermarket v/s You
- Trade-Offs
- Random
- Round Robin
- Join the Shortest Queue (JSQ)
 - “Power of 2”
- Least Work Left (LWL)
- Size-Aware

What not to do



http://www.gifbin.com/bin/o12013/1362076263_queueing_fail.gif