

Grocery stores and coffee shops: Using random choices to make good decisions

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Abstract: Imagine you're at the grocery store trying to pick the shortest checkout queue. Or imagine you're in a new town trying to pick the best coffee shop. These are important decisions, and hard to make without much information! Here I'll present two algorithms that use randomness to cope with these situations quickly and easily. I'll define the algorithms and prove that they are both efficient and lead to good decisions. The proofs use a range of techniques including random walks, differential equations, and Chernoff bounds. I'll also discuss applications which run the gamut from computer science to urban planning.