

Buying a toaster: multicriteria decision analysis (MCDA) in daily life

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Defining decision criteria

Family meeting

- Price
- Number of slots
- Evenness of toasting
- Adjustable toasting level



Defining the scale to capture relative weights of decision criteria

- Use a simple weight elicitation method for ease of use (e.g. scale 1 to 5)
- No 0 value as this would nullify consideration of a criteria selected by the family

Criteria	Weights Low ⟷ high
Adjustable toasting level	❑1 ❑2 ❑3 ❑4 ❑5
Evenness of toasting	❑1 ❑2 ❑3 ❑4 ❑5
Number of slots	❑1 ❑2 ❑3 ❑4 ❑5
Price	❑1 ❑2 ❑3 ❑4 ❑5

Defining anchors and toaster scoring scale for each criteria

- Ensure same scale direction for all criteria
- 0 is used to capture when characteristics of a toaster for a given criteria does not bring value
- Use a small scale for ease of use (e.g. 0 to 3)

Criteria (alphabetical)	Scale and anchors
Adjustable toasting level	❑0 – not available ❑1 ❑2 ❑3 – fully adjustable
Evenness of toasting	❑0 – very uneven ❑1 ❑2 ❑3 – uniformly even
Number of slots	❑0 – 1 slot ❑1 ❑2 ❑3 – 4 slots
Price	❑0 – very expensive ❑1 ❑2 ❑3 - inexpensive

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Data collection & synthesis for each criteria

- Decide how many toasters to choose amongst
- What is the source of information?
  - Local store
  - Consumer association reviews and test results
  - Technical sheets for each toaster
  - Experiences of family and friends

Using MCDA tool
Example: Bob's assessment
1st step - Weighting

- How important is each criteria relative to the others (weight)?
  (capture personal preferences)

Criteria	Bob's weights
Adjustable toasting level	❑1 ❑2 ☑3 ❑4 ❑5
Evenness of toasting	❑1 ☑2 ❑3 ❑4 ❑5
Number of slots	❑1 ❑2 ❑3 ❑4 ☑5
Price	❑1 ❑2 ❑3 ❑4 ❑5

Example: Bob's assessment
2nd step scoring Toaster A

Criteria	Synthesized data toaster A	Scores
Adjustable toasting level	Available, but no data on quality of adjustment (technical sheet)	❑0 – not available ☑1 ❑2 ❑3 – fully adjustable
Evenness of toasting	Excellent (technical sheet) Declines after 1 year (friend)	❑0 – very uneven ❑1 ☑2 ❑3 – uniformly even
Number of slots	4	❑0 – 1 slot ❑1 ❑2 ☑3 – 4 slots
Price	$55 (technical sheet) $50 (local store) $40 + shipping (internet)	❑0 – very expensive ❑1 ☑2 ❑3 - inexpensive

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Example: Bob's assessment
Calculating MCDA estimate of Toaster A

- Linear model combining normalized weights and scores

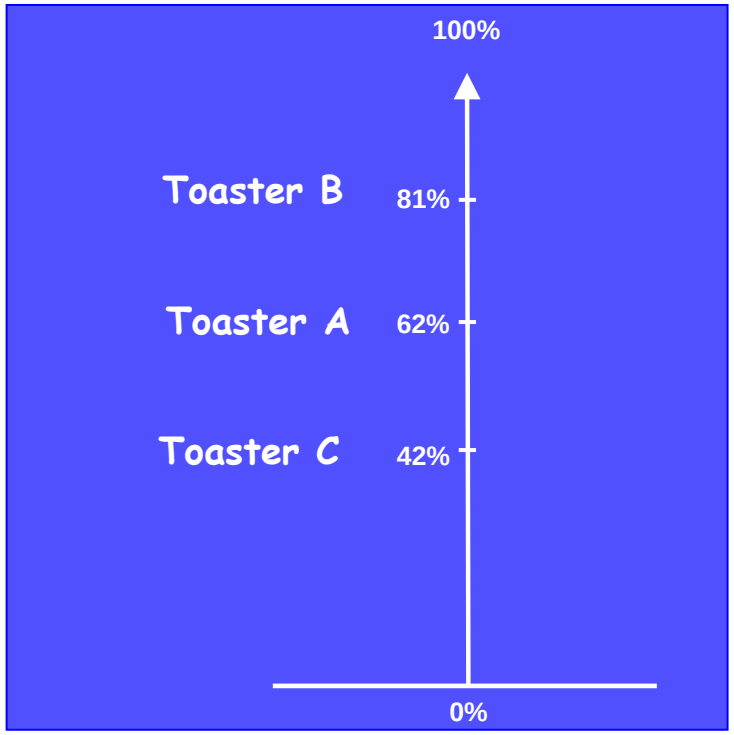
Criteria	Weight	Normalized weight	Toaster A	
			Score	Contribution to estimate
Adjustable toasting level	4	0.29	1	0.29
Evenness of toasting	3	0.21	2	0.42
Number of slots	2	0.14	3	0.42
Price	5	0.36	2	0.72
Total	-	1	-	1.85

- MCDA estimate for toaster A for Bob: 0.62 (or 62%) =(1.85/3)*100)

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Ranking of options

- Calculate average MCDA estimate for whole family



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Buying decision

- Toaster B best rank according to criteria considered
- Contextual criterion!
  - The kitchen counter is small – only toasters A and C will fit
- Toaster A was selected by the family; it will fit on the counter and it represents better value than C