

Decision Analysis

Tutorial Problem 7

You need a word-processing package for the personal computer in your office. Because your employer will pay for the package you are not concerned about the cost, but you would like a package which is as easy to use as possible and which also has a wide range of functions, such as a thesaurus, spell-checker and graphics. After discussing the matter with a friend who is something of an expert in this field, you identify seven potential packages and allocate values to them to reflect their ease of use and available facilities. These values are shown below (0 = worst, 100 = best):

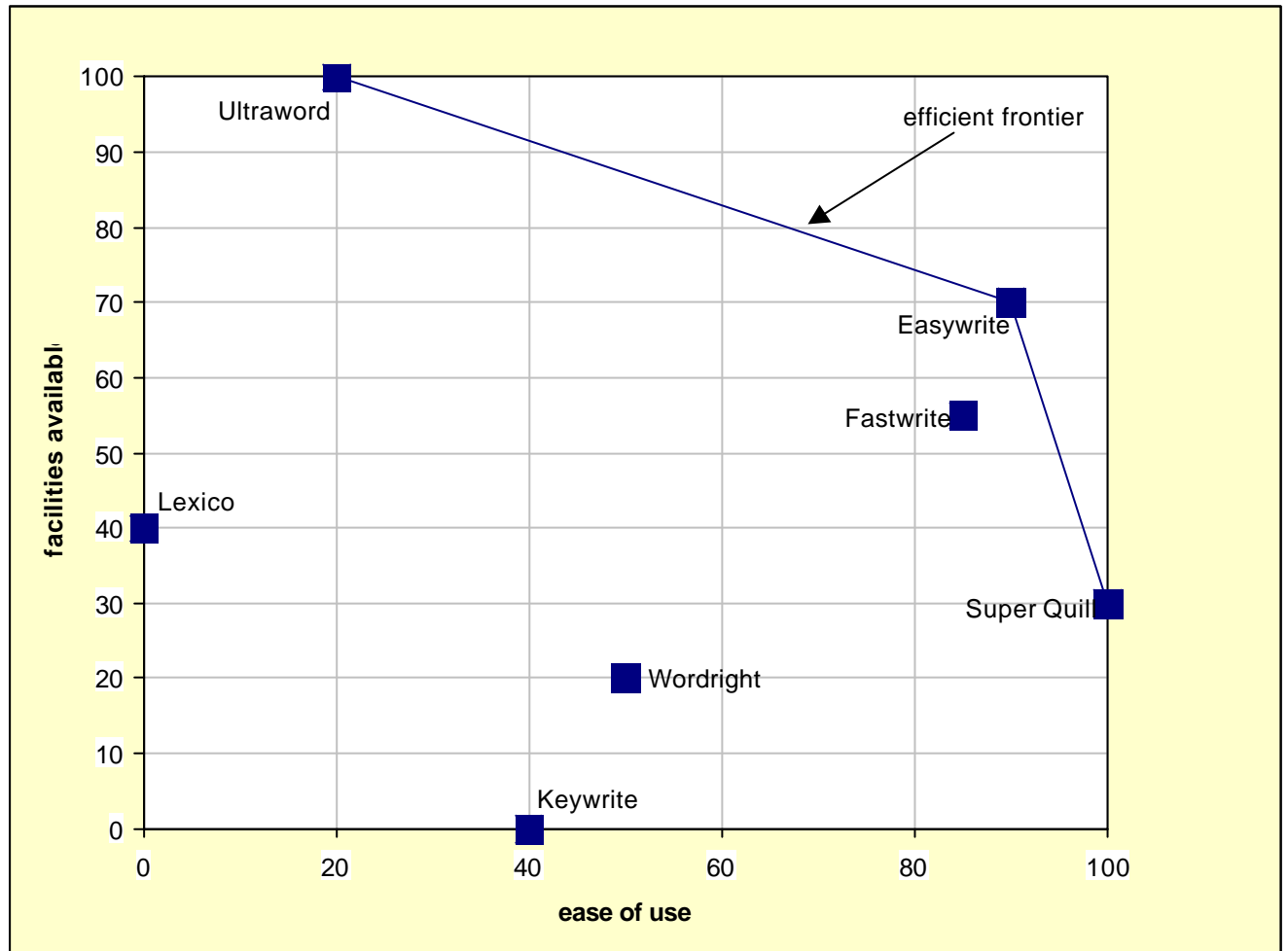
<u>Package</u>	<u>Ease of use</u>	<u>Facilities available</u>
Easywrite	90	70
Fastwrite	85	55
Keywrite	40	0
Lexico	0	40
Super Quill	100	30
Ultraword	20	100
Wordright	50	20

- Plot each package's value for 'ease of use' and 'facilities available' on a graph and hence determine the packages which lie on the efficient frontier.
- Suppose that you judge that a switch from a package with the least facilities available to one with the most facilities is only 60% as attractive as a switch from a package which is the least easy to use to one which is the most easy to use. Assuming that mutual preference independence exists between the two attributes, which package should you choose?
- After some reflection you realise that the extra facilities available on a package will be of little value to you if they are going to be difficult to use. What does this imply about your method of analysis in (b)?

Decision Analysis

Solution to Tutorial Problem 6

(a)



Super Quill, Easywrite and Ultraword all lie on the efficient frontier.

(b) The normalised weights are:

ease of use: $100/160 = 62.5$
 facilities available: $60/160 = 37.5$

weights		normalised
	ease of use	100
	facilities available	60
		160
		62.5
		37.5

The overall benefit values for the different packages are shown in the following table:

Package	Ease of use	Facilities available	overall benefits
Fastwrite	85	55	73.75
Keywrite	40	0	25.00
Lexico	0	40	15.00
Ultraword	20	100	50.00
Easywrite	90	70	82.50
Super Quill	100	30	73.75
Wordright	50	20	38.75
weights	62.5	37.5	

Easywrite has the highest overall benefits, and is the one that should be chosen.

(c) If extra facilities are of little value if they are going to be difficult to use, it sounds as if Facilities Available is NOT preference independent of Ease of Use. Because the two attributes are not, after all, mutually preference independent, the additive model is no longer valid and we can no longer rely on the results obtained in part (b).