Purchase Target

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The Decision Matrix

The Data

We won't use the logo. So, here is our decision matrix:

	price	sales_potential	engineering	team	loan	score
A	1.0e+06	low	low	low	no	2
B	2.0e+06	low	good	low	no	1
C	1.5e+07	high	good	good	1200000	1
D	3.0e+06	medium	excellent	good	no	5
E	2.5e+06	medium	good	low	no	3
F	4.0e+06	medium	excellent	good	1000000	5
G	3.0e+06	medium	good	low	no	4
H	6.0e+06	high	good	low	3000000	4

Normalised decision matrix

All values are between 0 (worst) and 1 (best)

	price	sales	eng	team	loan	score
A	1.00	0.0	0.0	0	1	0.25
B	0.93	0.0	0.5	0	1	0.00
C	0.00	1.0	0.5	1	0	0.00
D	0.86	0.5	1.0	1	1	1.00
E	0.89	0.5	0.5	1	1	0.50
F	0.79	0.5	1.0	1	0	1.00
G	0.86	0.5	0.5	1	1	0.75
H	0.64	1.0	0.5	1	0	0.75

MCDA Methods

Dominance

We only want to purchase **one** company, so we can leave out the dominated solutions. An arrow from X to Y means "X dominates Y".
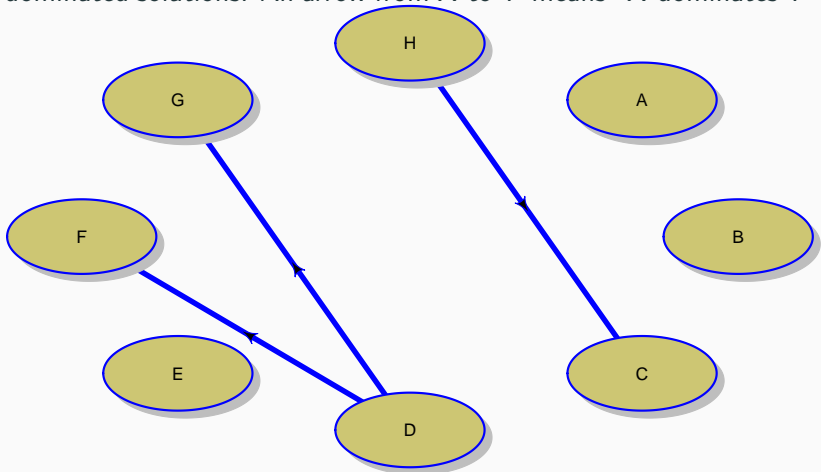
After deleting the dominated rows

	price	sales	eng	team	loan	score
A	1.00	0.0	0.0	0	1	0.25
B	0.93	0.0	0.5	0	1	0.00
D	0.86	0.5	1.0	1	1	1.00
E	0.89	0.5	0.5	1	1	0.50
H	0.64	1.0	0.5	1	0	0.75

Then we re-scale again:

	price	sales	eng	team	loan	score
A	1.0	0.0	0.0	0	1	0.25
B	0.8	0.0	0.5	0	1	0.00
D	0.6	0.5	1.0	1	1	1.00
E	0.7	0.5	0.5	1	1	0.50
H	0.0	1.0	0.5	1	0	0.75

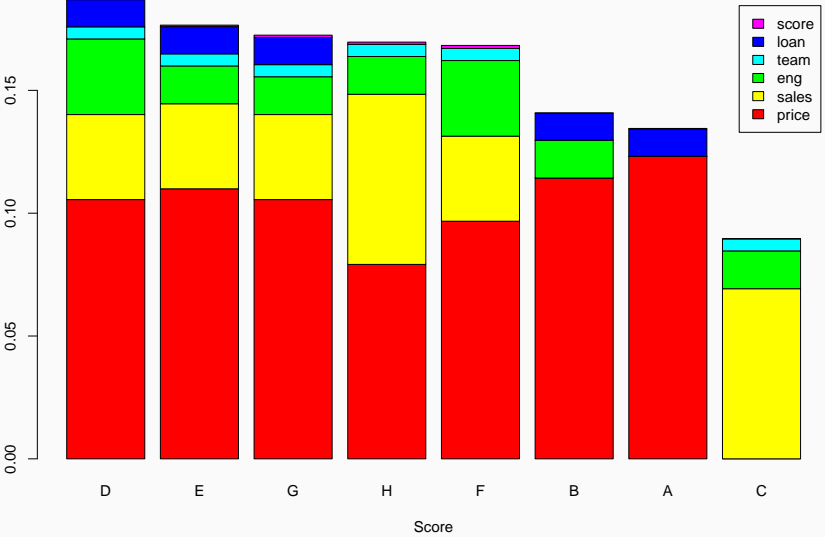## Weighted Sum Method: the weights

We decide on weights that reflect our preference for price, sales capacity, and to some extend the engineering capability of the purchase target:

criterion	weight
price	0.35
sales	0.26
eng	0.18
team	0.07
loan	0.11
score	0.04

Weighted Sum Method: the result
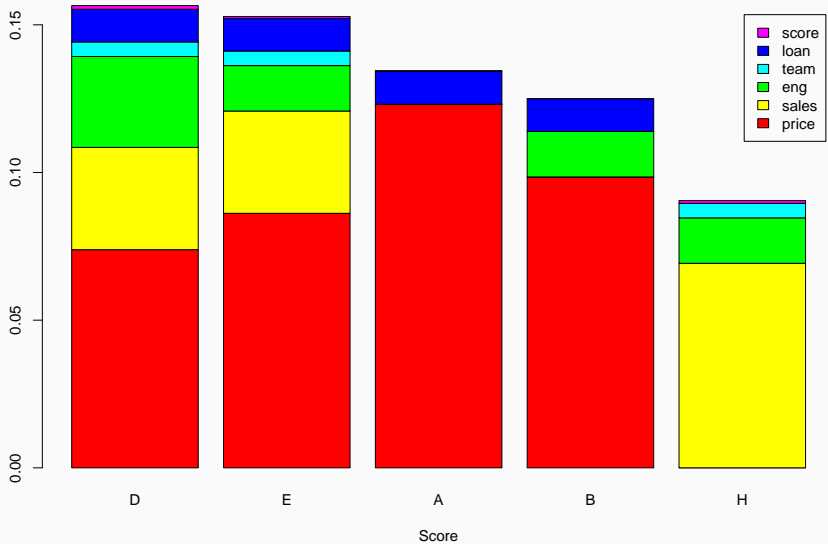
WSM with all alternatives
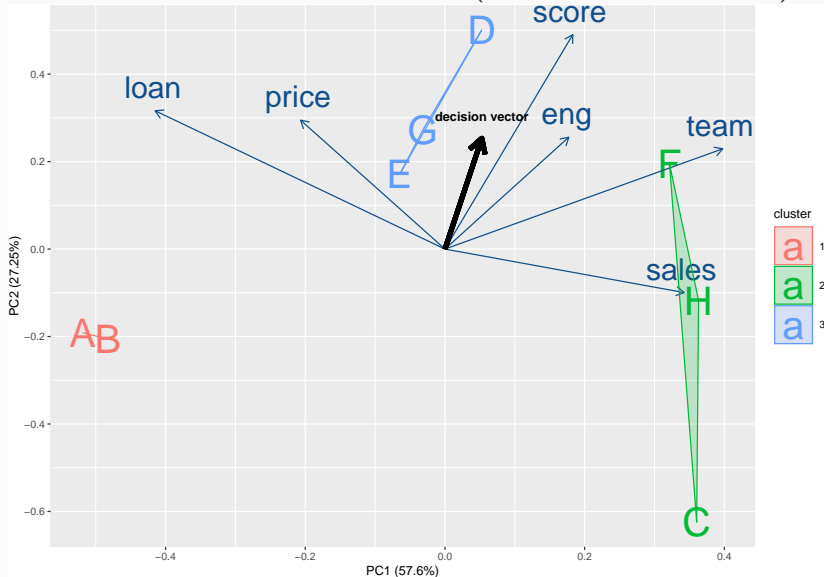
Conclusions WSM

The target company D is the best, followed by E. A is not a suitable target since it is the worst for Engineering and Sales.

Notes:

- score has too small weights in order to influence the choice presented here.
- The dominated solution G is actually the third best.

PCA and 3 clusters

Note that we included all alternatives (also the dominated ones)

Conclusions PCA

The projection in the plane ($PCA1$, $PCA2$) maximizes the distances between the different alternatives. We note that

- D is the most in the direction of the decision vector and hence the best target.
- G and E are close to the direction of the decision vector and hence acceptable, but not as good as D. Therefore the blue cluster is good to retain (in case something goes wrong with D, G might be an acceptable backup)
- the green cluster (F, H, and C) are solutions that score good on team and sales, but remember that these were the attributes that interested us least.
- A, B and C are opposite to the decision vector and hence really bad solutions.

Conclusions

Decission

- A: against (only price is good)
- B: against (good price, acceptable engineering, but no sales)
- C: against (certainly not - dominated by H)
- **D**: in favor (my preferred solution – note that we agree with the strategy team for solution D)
- E: in favor (if D and G didn't pass)
- F: against (is dominated by D – plus we don't need the team – note that we disagree with the strategy team for this target)
- G: against (is dominated by D, but without D is a good choice – it is second best)
- H: in favor (if we need sales, and sales alone)