"Learn what is to be taken seriously and
laugh at the rest."

— Herman Hesse —

1 Decision Theory
Besluitnemingsteorie

Layout
Uitleg

- *Kriteria vir besluitneming onder onsekerheid*
- Criteria for decision making under uncertainty:

5. Minimax regret

- *Oefening*
- Exercise

Minimax regret

Gebaseer op die **geleentheidverlies** of **spyt** en word bereken as die verskil tussen die optimale waarde van ‘n uitkoms en die eintlike waarde vir ‘n besluit.

- Skep ‘n geleentheidsverliestabel deur te bereken wat die geleentheidsverlies is as jy nie die beste alternatief kies nie;
- Bereken die geleentheidsverlies deur **elke opbrengs in die kolom af te trek van die beste opbrengs in die kolom**;
- Vind die **maksimum geleentheidsverlies vir elke alternatief** en kies die alternatief met die **kleinste waarde**.

Based on **opportunity loss** or **regret,** calculated as the difference between the optimal value for a state of nature (outcome) and actual value for a decision.

- Create an opportunity loss table by determining the opportunity loss from not choosing the best alternative;
- Calculate opportunity loss by **subtracting each payoff in the column from the best payoff in the column**;
- Find the **maximum opportunity loss for each alternative** and pick the alternative with the **minimum value**.

Minimax regret

	STATE OF NATURE	
	FAVORABLE MARKET	UNFAVORABLE MARKET
ALTERNATIVE	($)	($)
Construct a large plant	200,000	−180,000
Construct a small plant	100,000	−20,000
Do nothing	0	0

STATE OF NATURE	
FAVORABLE MARKET ($)	UNFAVORABLE MARKET ($)
200,000 − 200,000	0 − (−180,000)
200,000 − 100,000	0 − (−20,000)
200,000 − 0	0 − 0

TABLE 3.6 Determining Opportunity Losses for Thompson Lumber

Amount lost by not selecting the best option in a state of nature

(Minimization problem: subtract the min (best) in column from each value)

Minimax regret

	STATE OF NATURE	
	FAVORABLE MARKET	UNFAVORABLE MARKET
ALTERNATIVE	($)	($)
Construct a large plant	200,000	−180,000
Construct a small plant	100,000	−20,000
Do nothing	0	0

TABLE 3.7 Opportunity Loss Table for Thompson Lumber

	STATE OF NATURE	
	FAVORABLE MARKET	UNFAVORABLE MARKET
ALTERNATIVE	($)	($)
Construct a large plant	0	180,000
Construct a small plant	100,000	20,000
Do nothing	200,000	0

Loss values can never be negative (same for minimization problems)

Minimax regret

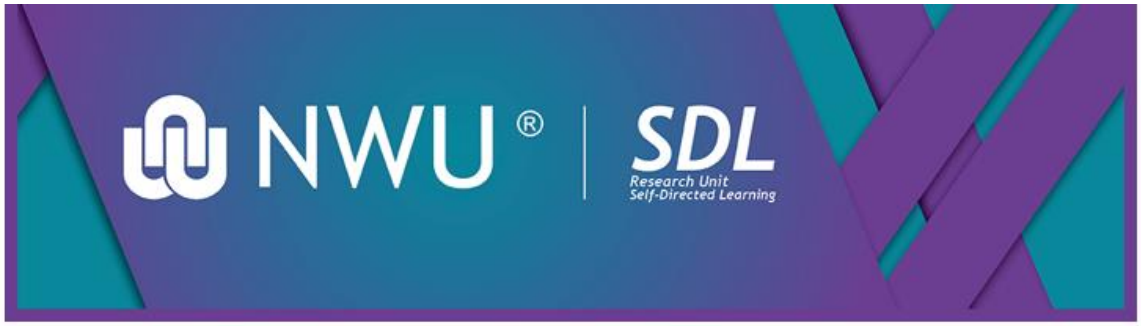
TABLE 3.8 Thompson's Minimax Decision Using Opportunity Loss

	STATE OF NATURE		
ALTERNATIVE	FAVORABLE MARKET ($)	UNFAVORABLE MARKET ($)	MAXIMUM IN A ROW ($)
Construct a large plant	0	180,000	180,000
Construct a small plant	100,000	20,000	100,000 Minimax
Do nothing	200,000	0	200,000

Select minimum (best) from the maximum loss (worst) in each row

(for minimization problems this stays the same!!)

Class exercise



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