

12. Metoda AHP

Analytic Hierarchy Process

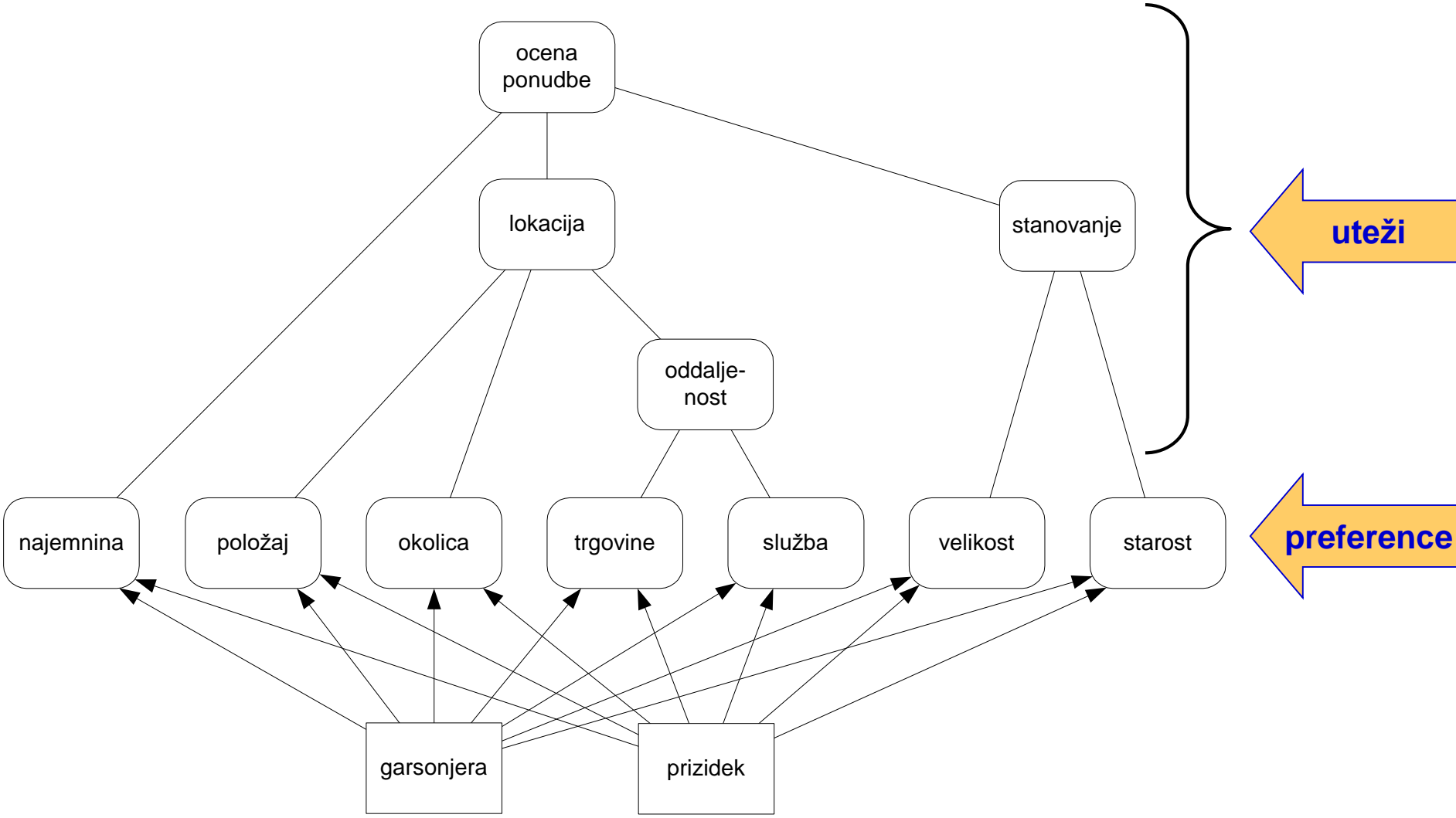
AHP

AHP: Analytic Hierarchy Process (Thomas Saaty, 1980)

Lastnosti:

- hierarhična večkriterijska metoda
- določitev uteži: primerjava atributov po parih
- določitev vhodnih preferenc: primerjava alternativ po parih

Metoda AHP



Primerjave po parih

- 1: enako pomembna kriterija oz. alternativni
- 3: zmerno večja pomembnost prvega kriterija oz. alternative 5: velika, znatna prednost
- 7: zelo velika prednost
- 9: skrajna, izjemna prednost

2,4,6,8 so vmesne vrednosti

Primerjave kriterijev → uteži

Matrika primerjav za kriterij

lokacija = f(položaj, okolica, oddaljenost)

	<i>položaj</i>	<i>okolica</i>	<i>oddaljenost</i>
<i>položaj</i>	1	5	3
<i>okolica</i>	1/5	1	1/3
<i>oddaljenost</i>	1/3	3	1

Izračun uteži:

	<i>položaj</i>	<i>okolica</i>	<i>oddaljenost</i>	utež
<i>položaj</i>	0,652	0,556	0,692	0,633
<i>okolica</i>	0,130	0,111	0,077	0,106
<i>oddaljenost</i>	0,217	0,333	0,231	0,260

Primerjave alternativ → preference

Primerjava stanovanj pri kriteriju *služba*:

<i>služba</i>	matrika primerjav		normirana matrika		koristnost
	<i>garsonjera</i>	<i>prizidek</i>	<i>garsonjera</i>	<i>prizidek</i>	
<i>garsonjera</i>	1	3	0,75	0,75	0,75
<i>prizidek</i>	1/3	1	0,25	0,25	0,25

Konsistentnost matrike primerjav

Ali je matrika konsistentna?

	<i>položaj</i>	<i>okolica</i>	<i>oddaljenost</i>
<i>položaj</i>	1	5	3
<i>okolica</i>	1/5	1	1/3
<i>oddaljenost</i>	1/3	3	1

Matrika je konsistentna, če največja lastna vrednost $\lambda_{max} = n$.

V tem primeru: $\lambda_{max} = 3,0385$, $n = 3$, torej matrika ni povsem konsistentna.

Consistency Index: $CI = \frac{\lambda_{max} - n}{n - 1} = 0,01925$.

Random Consistency Index RI :

n	1	2	3	4	5	6	7	8	9	10
RI	0	0	0.58	0.9	1.12	1.24	1.32	1.41	1.45	1.49

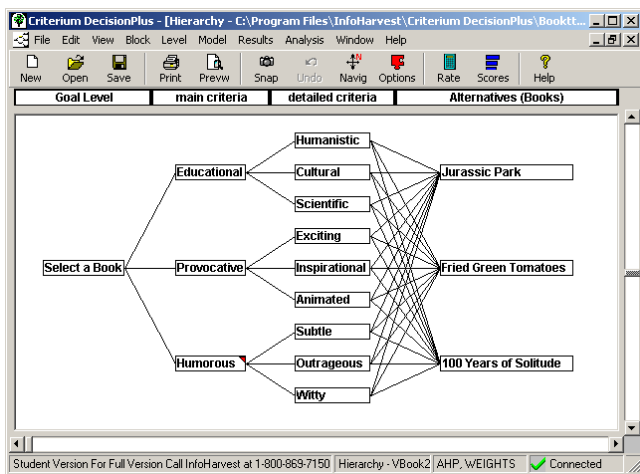
Consistency Ratio: $CR = \frac{CI}{RI} = 0,0332 = 3,32\%$

Matrika je “dovolj konsistentna”, če $CR \leq 10\%$.

Programi za AHP

Criterion DecisionPlus

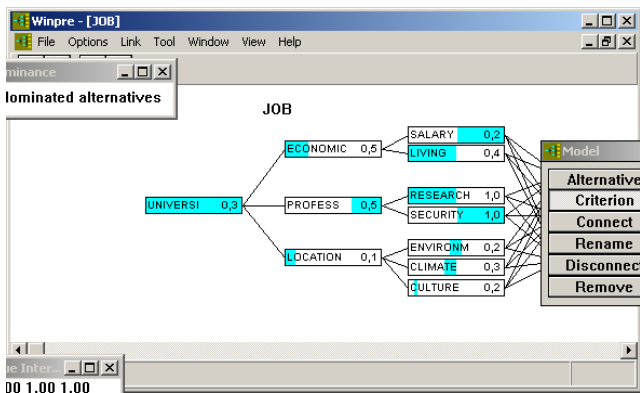
<http://www.infoharvest.com/>



BPMMSG AHP <https://bpmmsg.com/>

AHP Hierarchy

Level 0	Level 1	Level 2	Gib. Pr.
Project Selection <input type="button" value="AHP"/>	Stakeholders Commitment <input type="text" value="0.0698"/> <input type="button" value="AHP"/>	Team <input type="text" value="0.1782"/>	1.2 %
		Organizational <input type="text" value="0.0704"/>	0.5 %
		Project Manager <input type="text" value="0.7514"/>	5.2 %
	Financial <input type="text" value="0.4541"/> <input type="button" value="AHP"/>	Return on Investment <input type="text" value="0.0909"/>	4.1 %
		Profit (US\$) <input type="text" value="0.4545"/>	20.6 %
		Net Present Value <input type="text" value="0.4545"/>	20.6 %
	Strategic <input type="text" value="0.336"/> <input type="button" value="AHP"/>	Ability to compete <input type="text" value="0.5591"/>	18.8 %
		Internal Processes <input type="text" value="0.0887"/>	3.0 %
		Reputation <input type="text" value="0.3522"/>	11.8 %
	Other Criteria <input type="text" value="0.1401"/> <input type="button" value="AHP"/>	Lower Risk <input type="text" value="0.279"/>	3.9 %
		Urgency <input type="text" value="0.0719"/>	1.0 %
		Technical Knowledge <input type="text" value="0.6491"/>	9.1 %
OK. Check alternatives to evaluate <input type="button" value="Evaluate Alternatives"/>			1.0



WinPre

<http://sal.aalto.fi/en/resource/s/downloadables/winpre>

Web-HIPRE

<http://www.decisionarium.hut.fi/>

DECISIONARIUM - Pale Moon

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DECISIONARIUM

global space for decision support

DECISIONARIUM is a site for interactive multicriteria decision support with tools for individual decision making as well as for group collaboration and negotiation. The site is for academic use only. See [Decisionarium site for general use](#).

web software:

- [Web-HIPRE](#) value tree and AHP based decision support [publications](#) [slides](#)
- [Opinions-Online](#) platform for global participation, voting, surveys, and group decisions
- [RICH Decisions](#) rank inclusion in criteria hierarchies [publications](#)
- [Smart-Swaps](#) elimination of criteria and alternatives by even swaps [publications](#) [slides](#)
- [Joint Gains](#) multi-party negotiation support with the method of improving directions [publications](#) [slides](#)
- [RPM-Explorer](#) robust portfolio modeling [publications](#) [slides](#)

windows software:

- [WINPRE](#) decision analysis with imprecise ratio statements - preference programming, PAIRS [publications](#)
- [PRIME Decisions](#) decision analysis with imprecise ratio statements - PRIME method [publications](#)

eLearning material:

- [multiple criteria decision analysis](#) introduction to value tree analysis and to group decisions and voting; video clips on software use
- [negotiation analysis](#) introduction to game theory and negotiation

design and project leader
[professor Raimo P. Hämäläinen](#) 

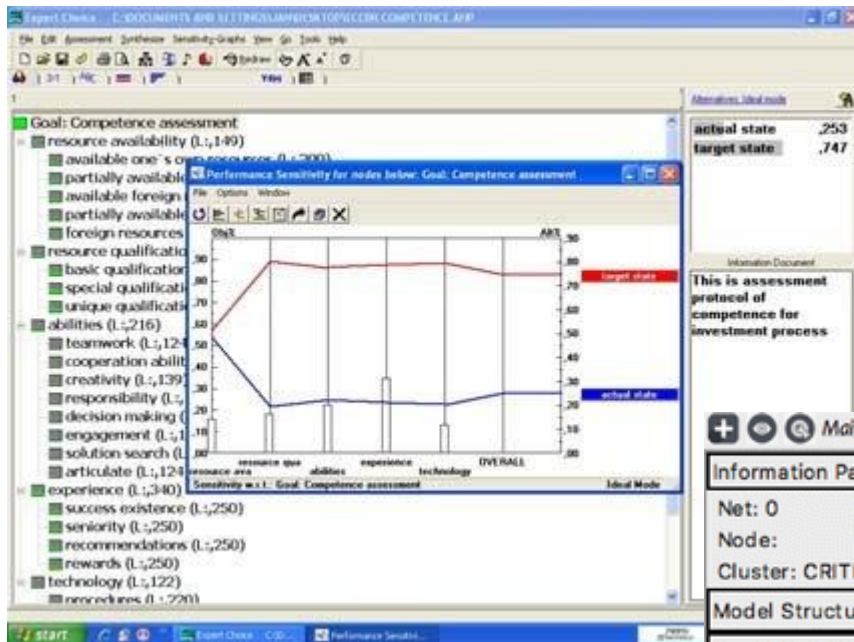
First opened: March 13, 2000. Last changed: May 31, 2013.

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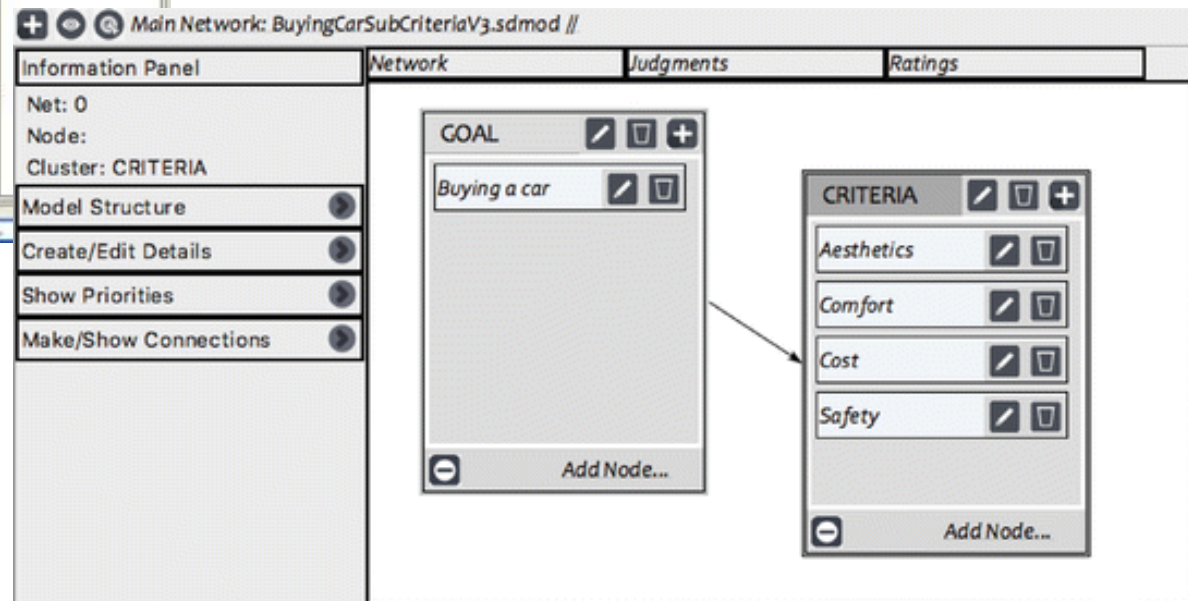
Programi za AHP

Expert Choice

<https://www.expertchoice.com/>



Super Decisions <https://www.superdecisions.com/>



Domača naloga 9

Izpolnite matriko primerjav in izračunajte uteži kriterijev

ocena ponudbe	<i>najemnina</i>	<i>lokacija</i>	<i>stanovanje</i>
<i>najemnina</i>			
<i>lokacija</i>			
<i>stanovanje</i>			

Izpolnite matriko primerjav in izračunajte koristnost alternativ glede na *oddaljenost trgovin*

trgovine	<i>garsonjera</i>	<i>prizidek</i>	<i>kmetija</i>	<i>stanovanje v bloku</i>
<i>garsonjera</i>				
<i>prizidek</i>				
<i>kmetija</i>				
<i>stanovanje v bloku</i>				