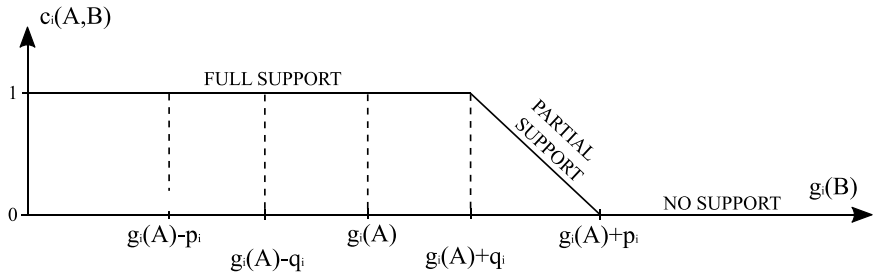
INTRODUCTION TO ARTIFICIAL INTELLIGENCE
Lab 5 – Decision Aiding – ELECTRE I

1) <u>MARGINAL CONCORDANCE:</u> Compute marginal concordance indexes for the given data (**the criterion is of a gain-type**):

$g_i(A)$	$g_i(B)$	q_i	p_i	$c_i(A,B)$
10	5	2	5	
7	7	2	5	
8	10	2	5	
5	10	2	5	
7	10	2	5	
	10	2	5	0.5



2) <u>COMPREHENSIVE CONCORDANCE & DISCORDANCE:</u> Calculate concordance and discordance indexes for all pairs of alternatives. The criteria are of a gain-type. Assume that the cutting level equals 0.85. For which pairs <u>a S b</u> is fulfilled?

WEIGHTS & THRESHOLDS FOR CRITERIA

	Weather	Cost	Food
q	0.1	0.1	0.1
p	0.2	0.25	0.3
v	0.3	0.4	1.0
w	0.5	0.2	0.3

PERFORMANCE MATRIX

	Weather	Cost	Food
Germany	0.7	0.7	0.5
Italy	0.9	0.5	0.8
Norway	0.6	0.2	0.7
Spain	0.9	0.4	0.6

(A) COMPREHENSIVE CONCORDANCECE

C(a, b)	G	I	N	S
G	-			
I	0.86	-	1	1
N	0.8	0.3	-	0.36
S	0.8	0.85	1	-

$C_{weat\ her}(G,I) =$
$C_{cost}(G,I) =$
$C_{food}(G,I) =$

$C(G,I) =$
$C(G,N) =$
$C(G,S) =$

$C_{weat\ her}(G,N) =$
$C_{cost}(G,N) =$
$C_{food}(G,N) =$

$C_{weat\ her}(G,S) =$
$C_{cost}(G,S) =$
$C_{food}(G,S) =$

(B) COMPREHENSIVE DISCORDANCE

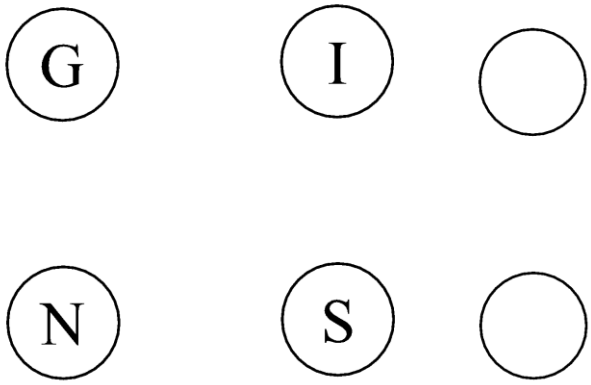
d(a, b)	G	I	N	S
G	-	0	0	0
I		-	0	0
N		1	-	1
S		0	0	-

(C) OUTRANKING MATRIX

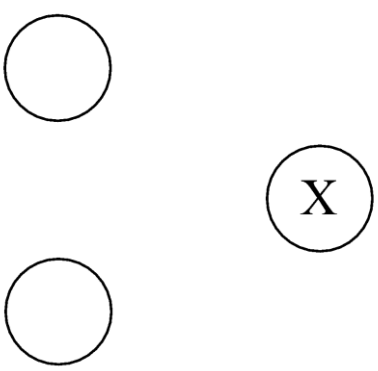
a S b	G	I	N	S
G	-			
I		-		
N			-	
S				-

3) <u>OUTRANKING GRAPH:</u> Draw outranking graph, remove cycles, and find the graph kernel.

<u>Outranking graph:</u>



<u>After the elimination of cycles:</u>



X =

Graph kernel: