

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1			U: 0.6	U: 0.6	U: 0.5	U: 0.6	U: 0.4	U: 0.3	U: 0.3	U: 0.3	U: 0.2	U: 0.3	U: 0.2	U: 0.2	U: 0.2	U: 0.2	U: 0.2	U: 0.2	U: 0.2	U: 0.2
			C: 250	C: 250	C: 300	C: 300	C: 250	C: 400	C: 450	C: 500	C: 400	C: 400	C: 500	C: 500	C: 500	C: 500	C: 500	C: 500	C: 500	C: 500
2	U: 0.9		U: 0.4	U: 0.6	U: 0.5	U: 0.6	U: 0.7						U: 0.2	U: 0.2	U: 0.2	U: 0.2	U: 0.2	U: 0.2	U: 0.2	U: 0.2
	C: 50		C: 350	C: 250	C: 300	C: 300	C: 250						C: 500	C: 500						
3	U: 0.9			U: 0.6	U: 0.5	U: 0.6	U: 0.7	U: 0.9	U: 0.5	U: 0.7	U: 0.7	U: 0.8	U: 0.8	U: 0.8						
	C: 50			C: 250	C: 300	C: 300	C: 250	C: 100	C: 350	C: 150	C: 200	C: 100	C: 100	C: 100						
4	U: 0.8	U: 0.7	U: 0.5	U: 0.5	U: 0.6	U: 0.7	U: 0.7	U: 0.6	U: 0.6	U: 0.9	U: 0.8	U: 0.8	U: 0.8	U: 0.8						
	C: 100	C: 250	C: 300	C: 300	C: 200	C: 250	C: 150	C: 200	C: 200	C: 100	C: 100	C: 150	C: 100	C: 100						
5	U: 0.9	U: 0.6	U: 0.5	U: 0.6	U: 0.7	U: 0.9	U: 0.8	U: 0.5	U: 0.6	U: 0.9	U: 0.7	U: 0.8	U: 0.8	U: 0.8						
	C: 50	C: 250	C: 300	C: 300	C: 150	C: 200	C: 100	C: 300	C: 300	C: 50	C: 200	C: 100	C: 100	C: 100						
6	U: 0.8	U: 0.7	U: 0.5	U: 0.7	U: 0.7	U: 0.8	U: 0.8	U: 0.2	U: 0.3	U: 0.7	U: 0.7	U: 0.7	U: 0.8	U: 0.8						
	C: 100	C: 50	C: 200	C: 150	C: 100	C: 50	C: 50	C: 400	C: 400	C: 150	C: 200	C: 200	C: 100	C: 100						
7	U: 0.5	U: 0.6	U: 0.4	U: 0.4	U: 0.5	U: 0.6	U: 0.7	U: 0.3	U: 0.6	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.7					
	C: 300	C: 300	C: 250	C: 300	C: 300	C: 300	C: 200	C: 400	C: 300	C: 100	C: 50	C: 100	C: 100	C: 100	C: 200					
8	U: 0.5	U: 0.6	U: 0.4	U: 0.4	U: 0.5	U: 0.6	U: 0.7	U: 0.3	U: 0.6			U: 0.8	U: 0.8	U: 0.8	U: 0.3					
	C: 300	C: 300	C: 250	C: 300	C: 300	C: 300	C: 200	C: 400	C: 300		C: 50	C: 100	C: 100	C: 100	C: 500					
9	U: 0.5	U: 0.6	U: 0.5	U: 0.6	U: 0.7	U: 0.9	U: 0.9	U: 0.9				U: 0.5	U: 0.8	U: 0.3	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.3
	C: 300	C: 300	C: 300	C: 300	C: 150	C: 50	C: 50	C: 50				C: 300	C: 100	C: 500	C: 100	C: 100	C: 100	C: 100	C: 100	C: 500
10	U: 0.5	U: 0.6	U: 0.5	U: 0.6	U: 0.7	U: 0.9	U: 0.8	U: 0.6	U: 0.7			U: 0.6	U: 0.8	U: 0.3	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.3
	C: 300	C: 300	C: 300	C: 300	C: 150	C: 50	C: 100	C: 200	C: 150			C: 200	C: 100	C: 500	C: 100	C: 100	C: 100	C: 100	C: 100	C: 500
11	U: 0.8	U: 0.7	U: 0.5	U: 0.5	U: 0.6	U: 0.7	U: 0.8	U: 0.6	U: 0.4	U: 0.5	U: 0.5	U: 0.5	U: 0.8	U: 0.3	U: 0.8	U: 0.8	U: 0.5	U: 0.8	U: 0.7	
	C: 100	C: 250	C: 300	C: 300	C: 200	C: 250	C: 100	C: 200	C: 400	C: 300	C: 400	C: 300	C: 100	C: 500	C: 100	C: 100	C: 300	C: 100	C: 150	
12	U: 0.5	U: 0.6	U: 0.5	U: 0.6	U: 0.7	U: 0.9	U: 0.8	U: 0.6	U: 0.5	U: 0.4	U: 0.5	U: 0.5	U: 0.8	U: 0.7	U: 0.8	U: 0.5	U: 0.5	U: 0.5	U: 0.5	U: 0.5
	C: 300	C: 250	C: 300	C: 300	C: 150	C: 200	C: 100	C: 200	C: 400	C: 400	C: 300	C: 300	C: 100	C: 150	C: 100	C: 300	C: 300	C: 300	C: 300	C: 300
13	U: 0.5	U: 0.7	U: 0.5	U: 0.7	U: 0.7	U: 0.8	U: 0.7	U: 0.5	U: 0.5	U: 0.5	U: 0.6	U: 0.5	U: 0.5	U: 0.5	U: 0.5	U: 0.5	U: 0.6	U: 0.5	U: 0.5	U: 0.5
	C: 200	C: 50	C: 200	C: 150	C: 100	C: 50	C: 100	C: 250	C: 300	C: 400	C: 300	C: 300	C: 300	C: 300	C: 300	C: 300	C: 250	C: 300	C: 300	C: 300
14	U: 0.4	U: 0.6	U: 0.4	U: 0.4	U: 0.5	U: 0.6	U: 0.8	U: 0.8	U: 0.6	U: 0.5	U: 0.6	U: 0.5	U: 0.4	U: 0.4	U: 0.5	U: 0.5	U: 0.6	U: 0.5	U: 0.5	U: 0.5
	C: 250	C: 300	C: 250	C: 300	C: 300	C: 300	C: 100	C: 100	C: 300	C: 300	C: 300	C: 300	C: 400	C: 400	C: 300	C: 300	C: 250	C: 300	C: 300	C: 300
15	U: 0.5	U: 0.6	U: 0.4	U: 0.4	U: 0.5	U: 0.6	U: 0.8	U: 0.5	U: 0.6	U: 0.7	U: 0.7	U: 0.8	U: 0.7	U: 0.5	U: 0.5	U: 0.5	U: 0.6	U: 0.5	U: 0.5	U: 0.5
	C: 300	C: 300	C: 250	C: 300	C: 300	C: 300	C: 50	C: 400	C: 200	C: 100	C: 150	C: 100	C: 200	C: 300	C: 300	C: 300	C: 250	C: 300	C: 300	C: 300
16	U: 0.5	U: 0.6	U: 0.5	U: 0.6	U: 0.7	U: 0.9	U: 0.8	U: 0.7	U: 0.6	U: 0.6	U: 0.5	U: 0.7	U: 0.6	U: 0.4	U: 0.5	U: 0.5	U: 0.6	U: 0.5	U: 0.5	U: 0.5
	C: 300	C: 300	C: 300	C: 300	C: 150	C: 100	C: 50	C: 150	C: 150	C: 250	C: 300	C: 150	C: 250	C: 400	C: 300	C: 300	C: 250	C: 300	C: 300	C: 300
17	U: 0.5	U: 0.6	U: 0.5	U: 0.6	U: 0.7	U: 0.9	U: 0.5	U: 0.6	U: 0.5	U: 0.6	U: 0.7	U: 0.8	U: 0.7	U: 0.7	U: 0.8	U: 0.8	U: 0.3	U: 0.7	U: 0.8	U: 0.8
	C: 300	C: 300	C: 300	C: 300	C: 150	C: 50	C: 300	C: 300	C: 300	C: 300	C: 200	C: 100	C: 200	C: 150	C: 100	C: 100	C: 500	C: 150	C: 100	C: 100
18	U: 0.5	U: 0.6	U: 0.5	U: 0.6	U: 0.7	U: 0.7	U: 0.6	U: 0.6	U: 0.5	U: 0.6	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.9	U: 0.9			
	C: 300	C: 300	C: 300	C: 300	C: 150	C: 150	C: 250	C: 300	C: 300	C: 200	C: 50	C: 100	C: 100	C: 100	C: 100	C: 100	C: 50	C: 50		
19	U: 0.5	U: 0.7	U: 0.5	U: 0.7	U: 0.7	U: 0.8	U: 0.7	U: 0.5	U: 0.5	U: 0.5	U: 0.6	U: 0.5	U: 0.5	U: 0.5	U: 0.7	U: 0.9	U: 0.9			U: 0.7
	C: 300	C: 50	C: 200	C: 150	C: 100	C: 50	C: 200	C: 250	C: 300	C: 400	C: 300	C: 300	C: 300	C: 300	C: 200	C: 50	C: 50			C: 150
20	U: 0.5	U: 0.6	U: 0.4	U: 0.4	U: 0.5	U: 0.6	U: 0.8	U: 0.8	U: 0.6	U: 0.5	U: 0.6	U: 0.5	U: 0.6	U: 0.7	U: 0.8	U: 0.9				U: 0.5
	C: 300	C: 300	C: 250	C: 300	C: 300	C: 300	C: 100	C: 100	C: 300	C: 300	C: 300	C: 300	C: 200	C: 200	C: 50	C: 50				C: 300
21																				

Optimization in TA-w6

Lowest
Cost
Solution
among groups
\$3650

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1			U: 0.6 C: 250	U: 0.6 C: 250	U: 0.5 C: 300	U: 0.6 C: 300	U: 0.4 C: 250	U: 0.3 C: 400	U: 0.3 C: 450	U: 0.3 C: 500	U: 0.2 C: 400	U: 0.3 C: 400	U: 0.2 C: 500	U: 0.2 C: 500	U: 0.2 C: 500	U: 0.2 C: 500	U: 0.2 C: 500	U: 0.2 C: 500	U: 0.2 C: 500	U: 0.2 C: 500
2	U: 0.9 C: 50		U: 0.4 C: 350	U: 0.6 C: 250	U: 0.5 C: 300	U: 0.6 C: 300	U: 0.4 C: 250	U: 0.3 C: 400	U: 0.3 C: 450	U: 0.3 C: 500	U: 0.2 C: 400	U: 0.3 C: 400	U: 0.2 C: 500	U: 0.2 C: 500	U: 0.2 C: 500	U: 0.2 C: 500	U: 0.2 C: 500	U: 0.2 C: 500	U: 0.2 C: 500	U: 0.2 C: 500
3	U: 0.9 C: 50			U: 0.6 C: 250	U: 0.5 C: 300	U: 0.6 C: 300	U: 0.7 C: 250	U: 0.9 C: 100	U: 0.5 C: 350									U: 0.8 C: 100	U: 0.8 C: 100	
4	U: 0.8 C: 100	U: 0.7 C: 250	U: 0.5 C: 300	U: 0.5 C: 300	U: 0.6 C: 200	U: 0.7 C: 250	U: 0.7 C: 150	U: 0.6 C: 200	U: 0.6 C: 200	U: 0.6 C: 100	U: 0.6 C: 100	U: 0.6 C: 150	U: 0.6 C: 100	U: 0.6 C: 100	U: 0.6 C: 100	U: 0.6 C: 100	U: 0.6 C: 100	U: 0.6 C: 100	U: 0.6 C: 100	U: 0.6 C: 100
5	U: 0.9 C: 50	U: 0.6 C: 250	U: 0.5 C: 300	U: 0.6 C: 300	U: 0.7 C: 150	U: 0.9 C: 200	U: 0.8 C: 100	U: 0.5 C: 300	U: 0.6 C: 300	U: 0.6 C: 50	U: 0.7 C: 200	U: 0.8 C: 100	U: 0.8 C: 100	U: 0.8 C: 100	U: 0.8 C: 100	U: 0.8 C: 100	U: 0.8 C: 100	U: 0.8 C: 100	U: 0.8 C: 100	U: 0.8 C: 100
6	U: 0.8 C: 100	U: 0.7 C: 50	U: 0.5 C: 200	U: 0.7 C: 150	U: 0.7 C: 100	U: 0.8 C: 50	U: 0.8 C: 50	U: 0.2 C: 400	U: 0.3 C: 400	U: 0.7 C: 150	U: 0.7 C: 200	U: 0.7 C: 200	U: 0.8 C: 100	U: 0.8 C: 100	U: 0.3 C: 500	U: 0.3 C: 500	U: 0.8 C: 100	U: 0.3 C: 500	U: 0.3 C: 500	U: 0.3 C: 500
7	U: 0.5 C: 300	U: 0.6 C: 300	U: 0.4 C: 250	U: 0.4 C: 300	U: 0.5 C: 300	U: 0.6 C: 300	U: 0.7 C: 200	U: 0.3 C: 400	U: 0.6 C: 300	U: 0.8 C: 100	U: 0.8 C: 50	U: 0.8 C: 100	U: 0.8 C: 100	U: 0.8 C: 200	U: 0.7 C: 300	U: 0.5 C: 400	U: 0.4 C: 100	U: 0.8 C: 100	U: 0.8 C: 100	U: 0.3 C: 500
8	U: 0.5 C: 300	U: 0.6 C: 300	U: 0.4 C: 250	U: 0.4 C: 300	U: 0.5 C: 300	U: 0.6 C: 300	U: 0.7 C: 200	U: 0.3 C: 400	U: 0.6 C: 300					U: 0.8 C: 50	U: 0.8 C: 100	U: 0.8 C: 100	U: 0.8 C: 100	U: 0.8 C: 100	U: 0.8 C: 100	U: 0.3 C: 500
9	U: 0.5 C: 300	U: 0.6 C: 300	U: 0.5 C: 300	U: 0.6 C: 300	U: 0.7 C: 150	U: 0.9 C: 50	U: 0.9 C: 50	U: 0.9 C: 50						U: 0.5 C: 300	U: 0.8 C: 100	U: 0.3 C: 500	U: 0.8 C: 100	U: 0.8 C: 100	U: 0.8 C: 100	U: 0.3 C: 500
10	U: 0.5 C: 300	U: 0.6 C: 300	U: 0.5 C: 300	U: 0.6 C: 300	U: 0.7 C: 150	U: 0.9 C: 50	U: 0.8 C: 100	U: 0.6 C: 200	U: 0.7 C: 150					U: 0.6 C: 200	U: 0.8 C: 100	U: 0.3 C: 500	U: 0.8 C: 100	U: 0.8 C: 100	U: 0.8 C: 100	U: 0.3 C: 500
11	U: 0.8 C: 100	U: 0.7 C: 250	U: 0.5 C: 300	U: 0.5 C: 300	U: 0.6 C: 200	U: 0.7 C: 250	U: 0.8 C: 100	U: 0.6 C: 200	U: 0.4 C: 400	U: 0.5 C: 300	U: 0.5 C: 400	U: 0.5 C: 300	U: 0.8 C: 100	U: 0.3 C: 500	U: 0.8 C: 100	U: 0.8 C: 100	U: 0.5 C: 300	U: 0.8 C: 100	U: 0.5 C: 150	U: 0.7 C: 150
12	U: 0.5 C: 300	U: 0.6 C: 250	U: 0.5 C: 300	U: 0.6 C: 300	U: 0.7 C: 150	U: 0.9 C: 200	U: 0.8 C: 100	U: 0.6 C: 200	U: 0.5 C: 400	U: 0.4 C: 400	U: 0.5 C: 300	U: 0.5 C: 300	U: 0.8 C: 100	U: 0.7 C: 150	U: 0.8 C: 100	U: 0.5 C: 300	U: 0.5 C: 300	U: 0.5 C: 300	U: 0.5 C: 300	U: 0.5 C: 300
13	U: 0.5 C: 200	U: 0.7 C: 50	U: 0.5 C: 200	U: 0.7 C: 150	U: 0.7 C: 100	U: 0.8 C: 50	U: 0.7 C: 100	U: 0.5 C: 250	U: 0.5 C: 300	U: 0.5 C: 400	U: 0.6 C: 300	U: 0.5 C: 300	U: 0.5 C: 300	U: 0.5 C: 300	U: 0.5 C: 300	U: 0.5 C: 300	U: 0.5 C: 250	U: 0.6 C: 300	U: 0.5 C: 300	U: 0.5 C: 300
14	U: 0.4 C: 250	U: 0.6 C: 300	U: 0.4 C: 250	U: 0.4 C: 300	U: 0.5 C: 300	U: 0.6 C: 300	U: 0.8 C: 100	U: 0.8 C: 100	U: 0.6 C: 300	U: 0.5 C: 300	U: 0.6 C: 300	U: 0.5 C: 300	U: 0.4 C: 400	U: 0.4 C: 400	U: 0.5 C: 300	U: 0.5 C: 300	U: 0.6 C: 250	U: 0.5 C: 300	U: 0.5 C: 300	U: 0.5 C: 300
15	U: 0.5 C: 300	U: 0.6 C: 300	U: 0.4 C: 250	U: 0.4 C: 300	U: 0.5 C: 300	U: 0.6 C: 300	U: 0.8 C: 50	U: 0.5 C: 400	U: 0.6 C: 200	U: 0.7 C: 100	U: 0.7 C: 150	U: 0.8 C: 100	U: 0.7 C: 200	U: 0.5 C: 300	U: 0.5 C: 300	U: 0.5 C: 300	U: 0.6 C: 250	U: 0.5 C: 300	U: 0.5 C: 300	U: 0.5 C: 300
16	U: 0.5 C: 300	U: 0.6 C: 300	U: 0.5 C: 300	U: 0.6 C: 300	U: 0.7 C: 150	U: 0.9 C: 100	U: 0.8 C: 50	U: 0.7 C: 150	U: 0.6 C: 150	U: 0.6 C: 250	U: 0.5 C: 300	U: 0.7 C: 150	U: 0.6 C: 250	U: 0.4 C: 400	U: 0.5 C: 300	U: 0.5 C: 300	U: 0.6 C: 250	U: 0.5 C: 300	U: 0.5 C: 300	U: 0.5 C: 300
17	U: 0.5 C: 300	U: 0.6 C: 300	U: 0.5 C: 300	U: 0.6 C: 300	U: 0.7 C: 150	U: 0.9 C: 50	U: 0.5 C: 300	U: 0.6 C: 300	U: 0.5 C: 300	U: 0.6 C: 300	U: 0.7 C: 200	U: 0.8 C: 100	U: 0.7 C: 200	U: 0.7 C: 150	U: 0.8 C: 100	U: 0.8 C: 100	U: 0.3 C: 500	U: 0.7 C: 150	U: 0.8 C: 100	U: 0.8 C: 100
18	U: 0.5 C: 300	U: 0.6 C: 300	U: 0.5 C: 300	U: 0.6 C: 300	U: 0.7 C: 150	U: 0.7 C: 150	U: 0.6 C: 250	U: 0.6 C: 300	U: 0.5 C: 300	U: 0.6 C: 200	U: 0.8 C: 50	U: 0.8 C: 100	U: 0.8 C: 100	U: 0.8 C: 100	U: 0.8 C: 100	U: 0.8 C: 100	U: 0.9 C: 50	U: 0.9 C: 50		
19	U: 0.5 C: 300	U: 0.7 C: 50	U: 0.5 C: 200	U: 0.7 C: 150	U: 0.7 C: 100	U: 0.8 C: 50	U: 0.7 C: 200	U: 0.5 C: 250	U: 0.5 C: 300	U: 0.5 C: 400	U: 0.6 C: 300	U: 0.5 C: 300	U: 0.5 C: 300	U: 0.5 C: 300	U: 0.7 C: 200	U: 0.9 C: 50	U: 0.9 C: 50			U: 0.7 C: 150
20	U: 0.5 C: 300	U: 0.6 C: 300	U: 0.4 C: 250	U: 0.4 C: 300	U: 0.5 C: 300	U: 0.6 C: 300	U: 0.8 C: 100	U: 0.8 C: 100	U: 0.6 C: 300	U: 0.5 C: 300	U: 0.6 C: 300	U: 0.5 C: 300	U: 0.6 C: 200	U: 0.7 C: 200	U: 0.8 C: 50	U: 0.9 C: 50				U: 0.5 C: 300
21																				

An illustration of Dykstra's Algorithm
(of which there are many variants)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1			U: 0.6	U: 0.6	U: 0.5	U: 0.6	U: 0.4	U: 0.3	U: 0.3	U: 0.3	U: 0.2	U: 0.3	U: 0.2	U: 0.2	U: 0.2	U: 0.2	U: 0.2	U: 0.2	U: 0.2	U: 0.2
2	U: 0.9		C: 250	C: 250	C: 300	C: 300	C: 250	C: 400	C: 450	C: 500	C: 400	C: 400	C: 500	C: 500	C: 500	C: 500	C: 500	C: 500	C: 500	C: 500
3	C: 50		U: 0.4	U: 0.6	U: 0.5	U: 0.6	U: 0.4	U: 0.3	U: 0.3	U: 0.3	U: 0.2	U: 0.3	U: 0.2	U: 0.2	U: 0.2	U: 0.2	U: 0.2	U: 0.2	U: 0.2	U: 0.2
4	U: 0.9		C: 350	C: 250	C: 300	C: 300	C: 250	C: 400	C: 450	C: 500	C: 400	C: 400	C: 500	C: 500	C: 500	C: 500	C: 500	C: 500	C: 500	C: 500
5	C: 50		U: 0.6	U: 0.5	U: 0.6	U: 0.7	U: 0.9	U: 0.5	U: 0.7	U: 0.7	U: 0.7	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.8
6	U: 0.8	U: 0.7	U: 0.5	U: 0.5	U: 0.6	U: 0.7	U: 0.7	U: 0.6	U: 0.6	U: 0.9	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.8
7	C: 100	C: 250	C: 300	C: 300	C: 200	C: 250	C: 150	C: 200	C: 200	C: 100	C: 100	C: 150	C: 100	C: 100	C: 100	C: 100	C: 100	C: 100	C: 100	C: 100
8	U: 0.9	U: 0.6	U: 0.5	U: 0.6	U: 0.7	U: 0.9	U: 0.8	U: 0.5	U: 0.6	U: 0.9	U: 0.7	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.8
9	C: 50	C: 250	250	C: 300	C: 150	C: 200	C: 100	C: 300	C: 300	C: 50	C: 200	C: 100	C: 100	C: 100	C: 100	C: 100	C: 100	C: 100	C: 100	C: 100
10	U: 0.8	U: 0.7	U: 0.7	U: 0.7	U: 0.7	U: 0.8	U: 0.8	U: 0.2	U: 0.3	U: 0.7	U: 0.7	U: 0.7	U: 0.8	U: 0.8	U: 0.3	U: 0.3	U: 0.8	U: 0.3	U: 0.3	U: 0.3
11	C: 100	C: 50	C: 200	C: 150	C: 100	C: 50	C: 50	C: 400	C: 400	C: 150	C: 200	C: 200	C: 100	C: 100	C: 500	C: 500	C: 100	C: 500	C: 100	C: 500
12	U: 0.5	U: 0.6	U: 0.4	U: 0.4	U: 0.5	U: 0.6	U: 0.7	U: 0.3	U: 0.6	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.7	U: 0.5	U: 0.4	U: 0.8	U: 0.8	U: 0.8	U: 0.3
13	C: 300	C: 300	C: 250	C: 300	C: 300	C: 300	C: 200	C: 400	C: 300	C: 100	C: 50	C: 100	C: 100	C: 200	C: 300	C: 400	C: 100	C: 100	C: 100	C: 500
14	U: 0.5	U: 0.6	U: 0.4	U: 0.4	U: 0.5	U: 0.6	U: 0.7	U: 0.3	U: 0.6	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.3	U: 0.7	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.3
15	C: 300	C: 300	C: 250	C: 300	C: 300	C: 200	C: 400	C: 300	C: 300	C: 50	C: 100	C: 100	C: 500	C: 150	C: 100	C: 100	C: 100	C: 100	C: 100	C: 500
16	U: 0.5	U: 0.6	U: 0.5	U: 0.5	U: 0.6	U: 0.7	U: 0.9	U: 0.9	U: 0.9	U: 0.9	U: 0.9	U: 0.9	U: 0.5	U: 0.8	U: 0.3	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.3
17	C: 300	C: 300	C: 300	C: 300	C: 300	C: 150	C: 50	C: 50	C: 50	C: 50	C: 50	C: 50	C: 300	C: 100	C: 100	C: 500	C: 100	C: 100	C: 100	C: 500
18	U: 0.5	U: 0.6	U: 0.5	U: 0.5	U: 0.6	U: 0.7	U: 0.8	U: 0.6	U: 0.4	U: 0.5	U: 0.5	U: 0.5	U: 0.8	U: 0.3	U: 0.8	U: 0.8	U: 0.5	U: 0.8	U: 0.7	U: 0.7
19	C: 100	C: 250	C: 300	C: 300	C: 200	C: 250	C: 100	C: 200	C: 400	C: 300	C: 400	C: 300	C: 100	C: 500	C: 100	C: 100	C: 300	C: 100	C: 100	C: 150
20	U: 0.5	U: 0.6	U: 0.5	U: 0.6	U: 0.7	U: 0.9	U: 0.8	U: 0.6	U: 0.5	U: 0.4	U: 0.5	U: 0.5	U: 0.8	U: 0.3	U: 0.8	U: 0.8	U: 0.5	U: 0.8	U: 0.8	U: 0.5
21	C: 300	C: 300	C: 300	C: 300	C: 300	C: 200	C: 250	C: 100	C: 200	C: 400	C: 300	C: 300	C: 100	C: 500	C: 100	C: 100	C: 300	C: 100	C: 100	C: 150
22	U: 0.5	U: 0.6	U: 0.4	U: 0.4	U: 0.5	U: 0.6	U: 0.8	U: 0.8	U: 0.6	U: 0.5	U: 0.6	U: 0.5	U: 0.6	U: 0.7	U: 0.8	U: 0.9	U: 0.9	U: 0.9	U: 0.9	U: 0.5
23	C: 300	C: 300	C: 250	C: 300	C: 300	C: 300	C: 100	C: 100	C: 300	C: 300	C: 300	C: 300	C: 200	C: 200	C: 50	C: 50	U: 0.7	U: 0.7	U: 0.7	C: 300
24	U: 0.5	U: 0.6	U: 0.4	U: 0.4	U: 0.5	U: 0.6	U: 0.8	U: 0.8	U: 0.6	U: 0.5	U: 0.6	U: 0.5	U: 0.6	U: 0.7	U: 0.8	U: 0.9	U: 0.9	U: 0.9	U: 0.9	U: 0.5
25	C: 300	C: 300	C: 250	C: 300	C: 300	C: 300	C: 100	C: 100	C: 300	C: 300	C: 300	C: 300	C: 200	C: 200	C: 50	C: 50	U: 0.7	U: 0.7	U: 0.7	C: 300

Shortest paths of cost 400 or less

250

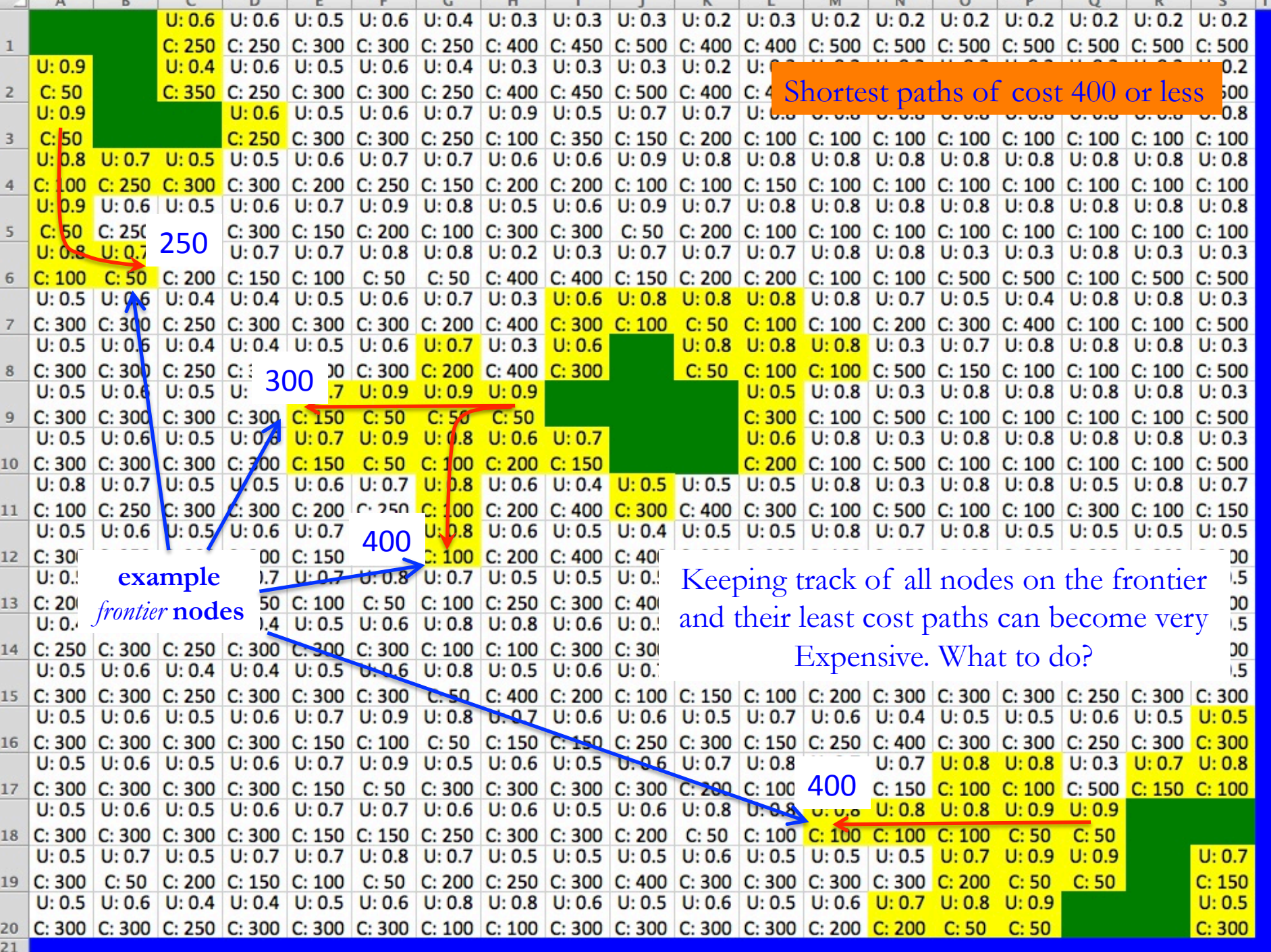
300

400

400

example frontier nodes

Keeping track of all nodes on the frontier and their least cost paths can become very Expensive. What to do?



1. Keep all the nodes on the frontier (and their least cost paths) on a *priority queue*. There is nothing particularly AI about this, but an AI would use it.

N1 5300

N2 5650

N3 5650

N4 6100

.

.

.

N_{m-1} 25100

N_m 26500

N1 5300

N2 5650

N3 5650

N7 7100

N4 6100

.

.

.

N_m 26500

.

.

.

N_{m-29} 22850

A priority queue could be a perfectly sorted list – go down list one by one and maintain perfect sort with each new step

Much better: Only perfectly sort those “as needed” (e.g., top 3) like Google (e.g., top 20)

Most/all appeared to use a **greedy approach** and did not maintain the full frontier

Some of you sought to minimize cost, and then add to (or otherwise tweak) solution to maximize utility, while staying under budget

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1			U: 0.6	U: 0.6	U: 0.5	U: 0.6	U: 0.4	U: 0.3	U: 0.3	U: 0.3	U: 0.2	U: 0.3	U: 0.2	U: 0.2	U: 0.2	U: 0.2	U: 0.2	U: 0.2	U: 0.2	U: 0.2
2	U: 0.9		U: 0.4	U: 0.6	U: 0.5	U: 0.6	U: 0.4	U: 0.3	U: 0.3	U: 0.3	U: 0.2	U: 0.3	U: 0.2	U: 0.2	U: 0.2	U: 0.2	U: 0.2	U: 0.2	U: 0.2	U: 0.2
3	C: 50		C: 350	C: 250	C: 300	C: 300	C: 250	C: 400	C: 450	C: 500	C: 400	C: 400	C: 500	C: 500	C: 500	C: 500	C: 500	C: 500	C: 500	C: 500
4	U: 0.8	U: 0.7	U: 0.5	U: 0.5	U: 0.6	U: 0.7	U: 0.7	U: 0.6	U: 0.5	U: 0.9	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.8
5	C: 100	C: 250	C: 300	C: 300	C: 200	C: 250	C: 150	C: 200	C: 200	C: 100	C: 100	C: 150	C: 100	C: 100	C: 100	C: 100	C: 100	C: 100	C: 100	C: 100
6	U: 0.8	U: 0.7	U: 0.5	U: 0.6	U: 0.7	U: 0.9	U: 0.8	U: 0.5	U: 0.6	U: 0.9	U: 0.7	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.8
7	C: 300	C: 300	C: 250	C: 300	C: 300	C: 300	C: 200	C: 400	C: 300	C: 100	C: 50	C: 100	C: 100	C: 200	C: 300	C: 400	C: 100	C: 100	C: 500	C: 500
8	U: 0.5	U: 0.6	U: 0.4	U: 0.4	U: 0.5	U: 0.6	U: 0.7	U: 0.3	U: 0.6	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.7	U: 0.5	U: 0.4	U: 0.8	U: 0.8	U: 0.8	U: 0.3
9	C: 300	C: 300	C: 250	C: 300	C: 300	C: 300	C: 200	C: 400	C: 300	C: 400	C: 300	C: 100	C: 100	C: 500	C: 150	C: 100	C: 100	C: 100	C: 100	C: 500
10	U: 0.5	U: 0.6	U: 0.5	U: 0.6	U: 0.7	U: 0.9	U: 0.9	U: 0.9	U: 0.9	U: 0.9	U: 0.8	U: 0.8	U: 0.8	U: 0.3	U: 0.7	U: 0.8	U: 0.8	U: 0.8	U: 0.8	U: 0.3
11	C: 300	C: 300	C: 300	C: 300	C: 150	C: 50	C: 100	C: 200	C: 150			C: 200	C: 100	C: 500	C: 100	C: 100	C: 100	C: 100	C: 100	C: 500
12	U: 0.8	U: 0.7	U: 0.5	U: 0.5	U: 0.6	U: 0.7	U: 0.8	U: 0.6	U: 0.4	U: 0.5	U: 0.5	U: 0.5	U: 0.8	U: 0.3	U: 0.8	U: 0.8	U: 0.5	U: 0.8	U: 0.7	U: 0.7
13	C: 100	C: 250	C: 300	C: 300	C: 200	C: 250	C: 100	C: 200	C: 400	C: 300	C: 400	C: 300	C: 100	C: 500	C: 100	C: 100	C: 300	C: 100	C: 150	C: 150
14	U: 0.5	U: 0.6	U: 0.5	U: 0.6	U: 0.7	U: 0.9	U: 0.8	U: 0.6	U: 0.5	U: 0.4	U: 0.5	U: 0.5	U: 0.8	U: 0.7	U: 0.8	U: 0.5	U: 0.5	U: 0.5	U: 0.5	U: 0.5
15	C: 300	C: 250	C: 300	C: 300	C: 150	C: 200	C: 100	C: 200	C: 400	C: 400	C: 300	C: 300	C: 100	C: 150	C: 100	C: 300	C: 300	C: 300	C: 300	C: 300
16	U: 0.5	U: 0.7	U: 0.5	U: 0.7	U: 0.7	U: 0.8	U: 0.7	U: 0.5	U: 0.5	U: 0.5	U: 0.6	U: 0.5	U: 0.5	U: 0.5	U: 0.5	U: 0.5	U: 0.6	U: 0.5	U: 0.5	U: 0.5
17	C: 200	C: 50	C: 200	C: 150	C: 100	C: 50	C: 100	C: 250	C: 300	C: 400	C: 300	C: 300	C: 300	C: 300	C: 300	C: 300	C: 250	C: 300	C: 300	C: 300
18	U: 0.4	U: 0.6	U: 0.4	U: 0.4	U: 0.5	U: 0.6	U: 0.8	U: 0.8	U: 0.6	U: 0.5	U: 0.6	U: 0.5	U: 0.4	U: 0.4	U: 0.5	U: 0.5	U: 0.6	U: 0.5	U: 0.5	U: 0.5
19	C: 250	C: 300	C: 250	C: 300	C: 300	C: 300	C: 100	C: 100	C: 300	C: 300	C: 300	C: 400	C: 400	C: 400	C: 300	C: 300	C: 250	C: 300	C: 300	C: 300
20	U: 0.5	U: 0.6	U: 0.4	U: 0.4	U: 0.5	U: 0.6	U: 0.8	U: 0.5	U: 0.6	U: 0.7	U: 0.7	U: 0.8	U: 0.7	U: 0.5	U: 0.5	U: 0.5	U: 0.6	U: 0.5	U: 0.5	U: 0.5
21	C: 300	C: 300	C: 250	C: 300	C: 300	C: 300	C: 50	C: 400	C: 200	C: 100	C: 150	C: 100	C: 200	C: 300	C: 300	C: 300	C: 250	C: 300	C: 300	C: 300
22	U: 0.5	U: 0.6	U: 0.5	U: 0.6	U: 0.7	U: 0.9	U: 0.8	U: 0.7	U: 0.6	U: 0.6	U: 0.5	U: 0.7	U: 0.6	U: 0.4	U: 0.5	U: 0.5	U: 0.6	U: 0.5	U: 0.5	U: 0.5
23	C: 300	C: 300	C: 300	C: 300	C: 150	C: 100	C: 50	C: 150	C: 150	C: 250	C: 300	C: 150	C: 250	C: 400	C: 300	C: 300	C: 250	C: 300	C: 300	C: 300
24	U: 0.5	U: 0.6	U: 0.5	U: 0.6	U: 0.7	U: 0.9	U: 0.5	U: 0.6	U: 0.5	U: 0.6	U: 0.7	U: 0.8	U: 0.7	U: 0.7	U: 0.8	U: 0.8	U: 0.3	U: 0.7	U: 0.8	U: 0.8
25	C: 300	C: 300	C: 300	C: 300	C: 150	C: 150	C: 250	C: 300	C: 300	C: 200	C: 50	C: 100	C: 100	C: 100	C: 100	C: 50	C: 50			
26	U: 0.5	U: 0.7	U: 0.5	U: 0.7	U: 0.7	U: 0.8	U: 0.7	U: 0.5	U: 0.5	U: 0.5	U: 0.6	U: 0.5	U: 0.5	U: 0.5	U: 0.7	U: 0.9	U: 0.9			U: 0.7
27	C: 300	C: 50	C: 200	C: 150	C: 100	C: 50	C: 200	C: 250	C: 300	C: 400	C: 300	C: 300	C: 300	C: 300	C: 200	C: 50	C: 50			C: 150
28	U: 0.5	U: 0.6	U: 0.4	U: 0.4	U: 0.5	U: 0.6	U: 0.8	U: 0.8	U: 0.6	U: 0.5	U: 0.6	U: 0.5	U: 0.6	U: 0.7	U: 0.8	U: 0.9				U: 0.5
29	C: 300	C: 300	C: 250	C: 300	C: 300	C: 300	C: 100	C: 100	C: 300	C: 300	C: 300	C: 300	C: 200	C: 200	C: 50	C: 50				C: 300

3600 cost + 1300 cost

You can invert the strategy and first maximize utility and then tweak for cost

Other comments

- All of you defined the “utility” of the corridor as the sum of utilities of the individual parcels
 - Should the “weakest link” (lowest utility, bottleneck for species movement be a factor?)
- Should the utility of a cell be a function of the path that it lies along (i.e., change as the algorithm is in the process of searching for solutions)?
- Robust optimization
- Optimizing (maximizing) “bang for the buck” (the utility/cost ratio)