

ZV08.

NELSON RESEARCH LABORATORIES  
STAFFORD E. E. CO. LTD.

No. 212.

NS t 1119

Sheet No.: 1.

DEUCE Programme No. 212 (ZV08)

Nim.

SUMMARY.

This programme uses the 1D and O.P.S. facility as a medium for playing the game of NIM.  
It was made at the N.R.L., London.

STAFFORDSHIRE COLLEGE OF TECHNOLOGY  
BEACONSIDE  
STAFFORD

COMPUTING  
DEPARTMENT

NELSON RESEARCH LABORATORIES  
STAFFORD E. E. CO. LTD.

NS t 1119.

Sheet No.: 2.

## DEUCE Programme No. 212 (ZV08)

Nim.

OPERATING INSTRUCTIONS.

This programme uses the I.D. and O.P.S. facility as a medium for playing the game of NIM.

Groups of brightened lamps on the O.P.S. represent piles of matches, the limit of any one pile being shown by the dimmed lamps at the extremes of a group.

To make a move (i.e. to remove lights from any one pile on the O.P.S.) signify the lights to be removed by brightening coincident lamps on I.D., then One Shot.

The game may be played with either of two objects; "CONT TIL" key normal - 'To take the last light', and "CONT TIL" key down - 'Not to take the last light'.

The player may change his mind as to the object of the game until the final stages, when DEUCE will hold the player to his previous decision.

Whilst a player is winning, he is able to change his mind at any stage of the game.

At all stages the object of the game is displayed in D.L.12.

SEQUENCE OF OPERATING.

Whilst running in the programme, synchronise display in D.L.12.

Set up the Piles with which game is to be played on the I.D.

One Shot, Piles now transferred to the O.P.S.

Clear I.D.

Either DEUCE or Player may have first move.

DEUCE first move, I.D. blank and One Shot.

Player first move, place move to be made on the I.D., then One Shot.

After One Shot, the number of lights specified on I.D. will be removed from the end of a coincident pile on the O.P.S.

DEUCE will carry on, compute its own move, then flash the move on the O.P.S. before finally dimming the lamps.

The next move may now be set up on the I.D.

One Shot, and so on.

Should any illegal move be attempted, the buzzer will sound and ERROR will be displayed in D.L.12. A legal move on the I.D. and One Shot will continue the game.

After the final move in the game, the result will be displayed in D.L.12, following a buzzer sequence.

DEUCE will now be ready to commence another game.

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Date  
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Nim

D.L. 1 Track 0/0 Card Nos. 8-10							D.L. 1 Track 0/7 Card Nos. 26-28							D.L. 1 Track 0/9 Card Nos. 32-34							
mc	NIS	S	D	C	W	T	mc	NIS	S	D	C	W	T	mc	NIS	S	D	C	W	T	
																					Y
																					X
																					0
																					1
0	4	11	1	1	21	20	0	7	16	14	0	4		0	1	11	1	1	22	21	2
1	1	27	14	0	0		1	1	13	16	0	0		1	1	27	21	0	6		3
2	1	13	15	0	0		2	1	14	25	0	26		2	1	15	16	0	25		4
3	1	25	28	0	0		3	1	30	13	0	16		3	1	28	22	1	26		5
4	1	27	14	0	2		4	1	19	15	0	26		4	1	24	14	0	4		6
5	1	24	14	0	0		5	1	16	15	0	16		5	1	8	30	0	25		7
6	1	27	25	0	29		6	1	13	15	0	0		6	1	24	14	0	7		8
7	1	14	28	0	25		7	1	25	28	0	0		7	1	21	28	0	1		9
8	1	25	28	0	0		8	1	27	14	0	8		8	1	25	28	0	28		Y
9							9	1	24	14	0	5		9	0	21	0	1	1		X
10	1	17	28	2	2		10	1	27	25	0	0		10	1	26	15	0	2		0
11	1	17	28	1	7		11	1	24	14	0	3		11	1	27	23	0	0		1
12	1	2	24	0	10		12	1	24	14	0	0		12	1	24	14	0	1		2
13	1	2	30	0	12		13	1	27	14	0	0		13	1	24	14	0	1		3
14	1	2	24	0	1		14	1	25	28	0	27		14	1	27	23	0	2		4
15	1	8	30	0	5		15	1	30	13	0	0		15	1	14	28	0	22		5
16							16	1	14	28	0	20		16	1	25	28	0	26		6
17	1	8	30	0	4		17	1	25	28	0	0		17	1	15	28	0	0		7
18	1	8	30	0	2		18	1	25	28	0	16		18	1	21	27	0	16		8
19							19	1	24	14	0	26		19	1	20	21	0	0		9
20	1	8	30	0	1		20	1	14	25	0	0		20	1	16	13	0	3		Y
21	1	2	24	0	26		21	1	27	14	0	16		21	1	16	15	0	0		X
22	7	11	1	1	2	1	22	1	24	14	0	0		22	1	9	21	0	0		0
23	7	11	1	1	2	1	23	1	27	14	0	0		23	1	26	21	1	3		1
24	1	3	30	0	1		24	1	25	28	0	0		24	1	30	20	1	0		2
25	1	2	30	0	0		25	1	25	28	0	1		25	1	15	26	0	0		3
26							26	1	24	14	0	14		26	1	10	16	4	5		4
27	1	11	12	1	1	0	27	1	14	25	0	1		27	1	13	27	0	5		5
28	1	15	28	0	0		28	1	24	14	0	27		28	1	14	13	0	0		6
29	1	4	30	0	1		29	1	26	16	0	5		29	1	21	22	0	0		7
30	1	17	28	2	12		30	1	24	14	0	31		30	1	27	14	0	0		8
31	1	30	13	0	0		31	1	25	28	0	0		31	1	27	22	0	0		9



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Date  
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Nim

D.L. 1 Track 0/8 Card Nos. 44 - 46, 29 - 31								D.L. 2 Track Card Nos. 47 - 49								D.L. 3 Track Card Nos. 50 - 52								
mc	NIS	S	D	C	W	T		mc	NIS	S	D	C	W	T		mc	NIS	S	D	C	W	T		
																								Y
																								X
																								0
																								1
0	1	0	16		0	5	X	0	1	19	14		0	0		0	2	16	15		0	0		2
1	1	26	29		0	0		1	1	9	20		3	13		1	1	16	15		0	20		3
2	1	25	13		0	0		2	2	24	14		0	0		2	0	20	15		0	24		4
3	3	26	19	1	0	1		3	2	20	25		1	1		3	6	14	15		0	0		5
4	1	26	25		0	0		4	1	25	28		0	5		4	4	9	14		2	18		6
5	1	31	13		0	9		5	2	27	14		0	0		5	0	13	0		0	0		7
6	1	14	26		0	1		6	2	20	14		0	0		6	1	31	17		0	0		8
7	7	16	28		0	2		7	3	9	21		1	1		7	2	7	24		0	7		"
8	1	30	16		0	0		8	2	24	20		0	0		8	4	15	28		0	1		Y
9	1	13	28		0	2		9	3	28	22		1	1		9	3	27	14		0	0		X
10	3	19	15		0	2		10	2	20	14		1	18		10	3	25	28		0	0		0
11	2	14	28		0	20		11	0	13	27		0	22		11	1	9	21		0	2		1
12	2	7	24		0	2		12	3	25	27		0	3		12	4	24	14		0	0		2
13	1	9	20		1	1		13	7	14	28		0	15		13	5	30	13		0	0		3
14	2	7	24		0	0		14	1	6	24		0	16		14	3	27	14		0	0		4
15	4	4	21		1	1		15	1	27	26		0	0		15	3	17	28		0	2		5
16	1	27	14		0	0		16	0	9	13		3	6		16	2	25	28		0	0		6
17	2	13	28		0	27		17	5	30	20	1	0	13		17	3	25	26		0	11		7
18	1	25	28		0	0		18	2	24	14		0	0		18	1	8	24		0	13		8
19	5	25	28		0	25		19	2	24	14		0	0		19	3	31	17		0	0		9
20	6	14	28		0	23		20	3	14	28		0	25		20	3	0	30		0	4		Y
21	0	20	0		1	1		21	2	25	28		0	0		21	3	2	24		0	0		X
22	3	11	12	1	8	7		22	0	24	20		1	12		22	5	28	26		0	20		0
23	7	15	19		1	4		23	3	24	14		0	23		23	0	15	28		0	24		1
24	6	16	28		0	0		24	5	16	28		0	0		24	0	21	17		0	2		2
25	1	28	22		0	0		25	7	13	28		0	20		25	2	11	12	1	20	20		3
26	1	20	28		0	0		26	2	24	20		0	0		26	1	11	1	1	1	0		4
27	0	0	13		0	0		27	4	15	28		0	0		27	0	20	28		0	4		5
28	1	14	15		0	0		28	2	24	14		0	0		28	0	14	1		0	10		6
29	1	20	14		0	20		29	2	11	12	1	17	1		29	0	10	14		0	14		7
30	0	0	0		0	0		30	2	2	28		0	0		30	0	10	28		0	28		8
31	0	0	0		0	0		31	0	0	21	2	27	1		31	7	14	28	1	0	22		9

Deuce Programme No. 212 (2 v 08)

Nura.

D.L. 4 Track							D.L. 5 Track							D.L. 6 Track							
Card Nos. 53-55							Card Nos. 56-58							Card Nos. 59-61							
INC	NIS	S	D	C	W	T	INC	NIS	S	D	C	W	T	INC	NIS	S	D	C	W	T	
																					Y
																					X
																					0
																					1
0	4	19	15		0	0	0	4	27	17		1	1	0	3	17	14		1	1	2
1	2	24	20		0	0	1	5	9	13		2	0	1	7	20	14		0	1	3
2	4	25	28		0	0	2	1	24	14		0	11	2	4	7	24		0	2	4
3	2	30	10	1	1	0	3	3	27	14		0	0	3	4	27	26		0	26	5
4	5	13	14		0	14	4	0	21	0	1	0	1	4	0	14	0		0	0	6
5	2	16	15		0	21	5	7	2	30		0	12	5	4	25	28		0	0	7
6	5	28	22	1	5	8	6	6	16	28		0	0	6	5	28	22		1	28	8
7	4	24	14		0	0	7	5	15	26		0	0	7	5	9	21		0	1	9
8	4	27	20		0	0	8	0	24	14		0	0	8	1	9	20		12	27	Y
9	6	30	20		0	26	9	2	27	26		0	0	9	5	5	30		0	0	X
10	6	24	17		3	3	10	5	9	21		0	0	10	7	19	15		0	6	0
11	4	29	25		0	0	11	0	11	12	1	1	0	11	7	2	24		0	0	1
12	4	28	22		0	1	12	0	21	0		0	0	12	1	1	30		0	8	2
13	0	21	0		0	0	13	5	14	29		0	2	13	0	20	0	1	0	9	3
14	3	14	29		0	25	14	0	21	0		0	0	14	1	24	14		0	2	4
15	4	25	28		0	3	15	4	27	25		0	0	15	6	20	13		0	0	5
16	6	15	28		0	0	16	0	21	0		0	0	16	5	20	14		1	1	6
17	1	24	14		0	0	17	5	27	14		0	3	17	4	14	25		0	0	7
18	4	30	13		0	0	18	1	25	28		0	0	18	7	9	30		0	0	8
19	5	13	20		0	0	19	3	27	22	1	0	1	19	6	25	28		0	0	9
20	0	21	0		0	0	20	3	14	27		0	27	20	7	0	31		0	1	Y
21	4	27	25		0	29	21	5	13	14		0	0	21	0	21	0		0	0	X
22	4	9	14		3	0	22	5	13	15		0	0	22	6	20	14		0	0	0
23	0	21	0		0	0	23	5	26	15		0	0	23	4	5	30		0	0	1
24	0	12	28		0	0	24	6	25	28		0	16	24	0	13	0		0	0	2
25	1	11	12	1	22	21	25	4	15	19		1	8	25	1	11	1	1	19	18	3
26	6	16	13		0	0	26	4	31	16		0	0	26	7	20	28		0	0	4
27	2	24	14		0	23	27	0	2	24		0	21	27	6	16	15		0	0	5
28	5	24	14		0	0	28	5	15	28		0	7	28	6	29	26		0	0	6
29	7	20	14		0	0	29	5	24	26		0	0	29	6	25	28		0	0	7
30	0	15	13		0	0	30	4	25	28		0	27	30	7	13	28		0	0	8
31	6	13	28		0	1	31	5	13	28		0	0	31	3	28	25		0	4	9



Deuce Programme No. 212 (2V08)

Name.

D.L. 7      Track							D.L. 8      Track							D.L. 9      Track										
Card Nos. 62 - 64							Card Nos. 65 - 67							Card Nos. 41 - 43										
mc	NIS	S	D	C	W	T	mc	NIS	S	D	C	W	T	mc	NIS	S	D	C	W	T				
																						Y		
																						X		
																						0		
																						1		
0	7	28	22	1	0	1	0	0	29	26		0	0	0								2		
1	5	14	20		0	1	1	2	23	14		0	10		1	2	10	15		4	18	3		
2	7	27	14		0	1	2	0	13	28		0	0		2							4		
3	7	24	14		0	0	3	2	15	16		0	17		3	1	10	16		8	15	5		
4	6	9	13		1	1	4	6	24	14		0	0		4	7	11	13		22	2	6		
5	0	21	0	1	0	1	5	5	6	13		0	0		5	6	11	13		16 (15)	8	7		
6	7	26	19		0	7	6	0	3	30		0	6		6	2	14	13		0	0	8		
7	0	2	30		0	5	7	0	9	16	1	0	22		7	6	25	10		4	20	9		
8	0	9	21		1	1	8	0	13	28		0	11		8	0	9	21		3	3	Y		
9	5	24	14		0	2	9	0	21	28		0	18		9	5	28	10		7	26	X		
10	6	19	29		0	0	10	4	14	13		0	0		10	2	13	10		14	23	0		
11	3	17	28		3	25	11	0	9	13	1	0	2		11							1		
12	2	16	15		0	18	12	0	19	21		1	6		12	4	10	15		16	0	2		
13	0	30	17		3	3	13	6	7	30		0	10		13	1	13	10		0	8	3		
14	7	19	15		0	2	14	7	9	16	1	0	11		14							4		
15	7	8	30		0	0	15	0	8	24		0	5		15							5		
16	3	24	14		0	7	16	0	9	13		1	26		16	1	24	14		0	0	6		
17	7	11		1	11	10	17	7	3	30		0	0		17							7		
18	6	9	20		0	3	18	3	4	30		0	5		18	3	10	15		8	16	8		
19	4	11	12	1	2	1	19	3	5	30		0	4		19							9		
20	1	11		1	1	0	20	0	27	26		0	1		20	3	26	14		0	1	Y		
21	4	6	24		0	0	21	0	27	23		0	18		21							X		
22	2	27	26		0	1	22	0	19	29		0	1		22	7	27	25		0	15	0		
23	7	0	19	1	0	17	X	23	0	13	2		18		23	7	0	19	1	0	2	1		
24	1	30	17	1	0	6		24	2	6	30		0	3		24	1	13	15		14	3	2	
25	6	31	17		3	15		25	0	27	26		0	13		25	6	11	13		6 (15)	4	3	
26	7	14	15		0	17		26	0	12	30		0	0		26	7	11	13		12	2	4	
27	3	11	12	1	8	7		27	2	10	30		0	2		27	7	0	19	1	0	2	5	
28	1	9	21		0	1		28	6	9	21	2	6	4		28							6	
29	0	9	16		0	0		29	0	16	0	1	0	7		29							7	
30	6	15	20		0	1		30	0	8	24		0	16		30	4	12	16		7	16	8	
31	0	26	15		0	0		31	7	14	28		1	6		31	1	0	16		0	31	X	9



















