GAME THEORY & DYNAMIC MODELING

		Colin	
		C	D
Rowe	C	3 3	0 5
	D	5 0	1 1

Prisoners' Dilemma

DYNAMIC PROGRAMMING

divide an optimisation problem into incremental subproblems for which optimal solutions can be obtained

enables identifying the optimal among multiple possible solutions

characterised by working 'backward' (*i.e.*, reverse recursion)

REVERSE RECURSION 1

$Q_{f,j} = (1 - p_j)\ (Q_i - c_j + f_j\ v_j)$

	j = 1 (safe)	j = 2 (risky)
p	0	0.5
c	1	1
f	0	0.5
v	0	4

REVERSE RECURSION 2

P(survival, j) =

$(1 - p_j)$	$Q_i - c_j > 0$
$(1 - p_j)\, f_j$	$Q_i - c_j \le 0$
0	$Q_f \le 0$

	j = 1 (safe)	j = 2 (risky)
p	0	0.5
c	1	1
f	0	0.5
v	0	4

REVERSE RECURSION 3

$$Q_{f,j} = (1 - p_j)\,(Q_i - c_j + f_j\, v_j)$$

	j = 1 (safe)		j = 2 (risky)	
Q_i	Q_f	P	Q_f	P
2	1	1	1.5	0.5
1	0	0	1	0.25