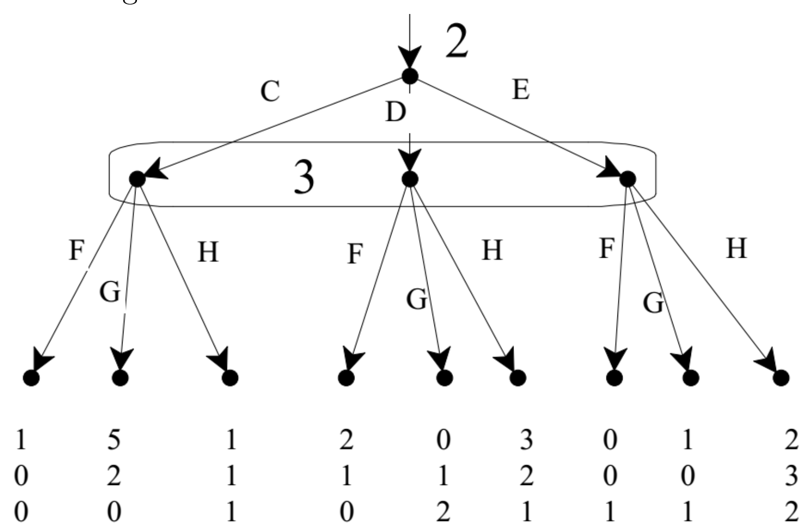
Problem 1

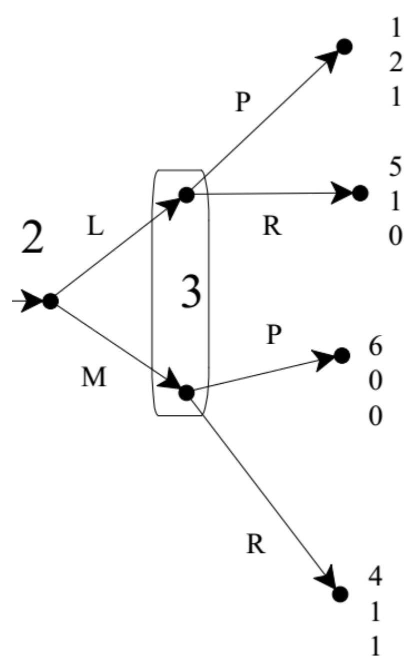
Focus on the bottom subgame first.



	F	**G**	**H**
C	$0, 0$	$\mathbf{2}, 0$	$1, \mathbf{1}$
D	$\mathbf{1}, 0$	$1, \mathbf{2}$	$2, 1$
E	$0, 1$	$0, 1$	$\mathbf{3}, \mathbf{2}$

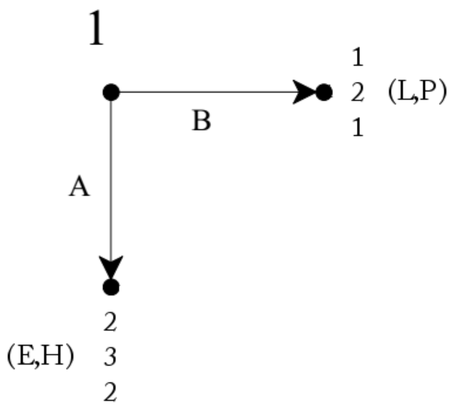
Unique Nash of the subgame is (E, H) with payoffs $2, 3, 2$.

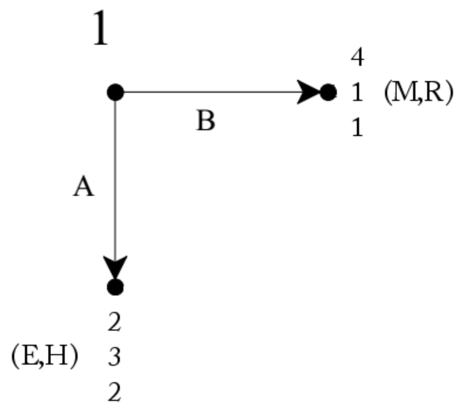
The other subgame is



	P	**R**
L	$\mathbf{2}, \mathbf{1}$	$\mathbf{1}, 0$
M	$0, 0$	$\mathbf{1}, \mathbf{1}$

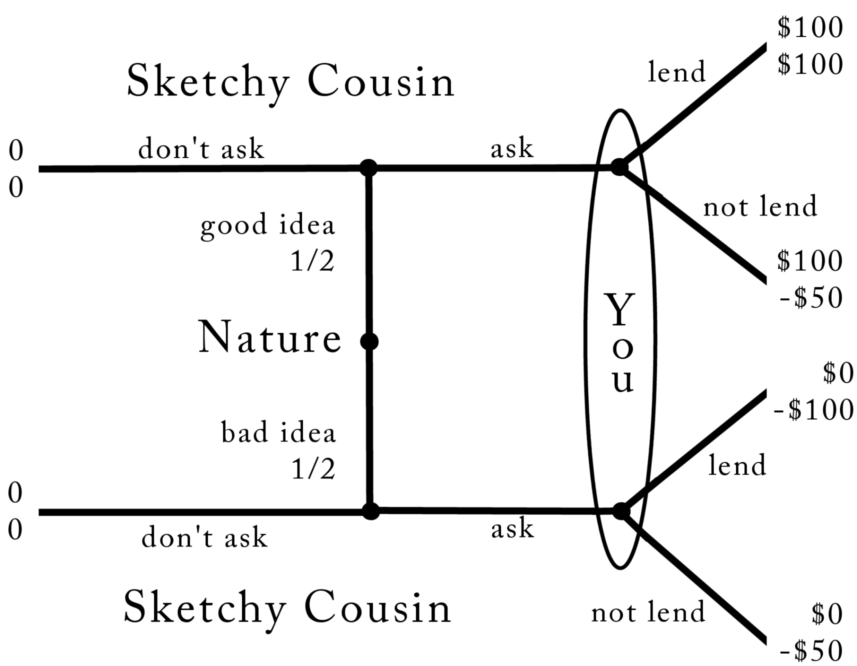
Two Nashies in the subgame: (L, P) with payoffs $1, 2, 1$; and (M, R) with payoffs $4, 1, 1$. Hence the bigger game reduces into two reduced games.





In the left game, Player 1 would choose A. Hence its subgame-perfect equilibrium is (A, EL, HP). In the right game, Player 1 would choose B. Hence its subgame perfect equilibrium is (B, EM, HR).

Problem 2



First note that there are no proper subgames. Hence any subgame-perfect equilibria must also be the Nash equilibria of the entire game.

You only have one information set, thus you only need specify L for lend or N for not-lend. Sketchy cousin has two information sets, however, so actions need be specified for both. An example of a strategy profile, then, is (AD, L), which means: if good idea, cousin asks (A); if bad idea, cousin doesn't ask (D); if asked, you lend money (L).

Now let's calculate payoffs for each strategy profile.

$$\begin{aligned}
(AA, L): &\quad 0.50[100, 100] + 0.50[0, -100] = [50, 0],\\
(AD, L): &\quad 0.50[100, 100] + 0.50[0, 0] = [50, 50],\\
(DA, L): &\quad 0.50[0, 0] + 0.50[0, -100] = [0, -50],\\
(DD, L): &\quad 0.50[0, 0] + 0.50[0, 0] = [0, 0],\\
(AA, N): &\quad 0.50[100, -50] + 0.50[0, -50] = [50, -50],\\
(AD, N): &\quad 0.50[100, -50] + 0.50[0, 0] = [50, -25],\\
(DA, N): &\quad 0.50[0, 0] + 0.50[0, -50] = [0, -25],\\
(DD, N): &\quad 0.50[0, 0] + 0.50[0, 0] = [0, 0].
\end{aligned}$$

Hence the strategic form of the game is

	L	N
AA	$50, 0$	$50, -50$
AD	$50, 50$	$50, -25$
DA	$0, -50$	$0, -25$
DD	$0, 0$	$0, 0$

Hence the Nash equilibria (and thus SPE) are (AA, L) and (AD, L). I guess the lesson is either: 1. The probability that your cousin has a good idea outweighs his sketchiness; or 2. Just lend to him anyway because you don't want your window smashed.