		Player 2	
		Head (q)	Tail $(1-q)$
Player1	Heads (p)	1, -1	-1,1
	Tails $(1-p)$	-1,1	1,-1

the mixed strategy Nash equilibrium in this game can be found when the both players expected payoffs are maximal. For player 1 this can be done when

$$pq+(1-q)(-p)+(1-p)(-q)+(1-p)(1-q)=4\mathrm{pq}-2\mathrm{p}-2\mathrm{q}+1=p(4\mathrm{q}-2)-2\mathrm{q}+1$$

is maximal. From $p(4\mathrm{q}-2)-2\mathrm{q}+1$ it is clear that to maximize p the following best response equations exist

$$B_1(q)=\begin{cases}4\mathrm{q}-2>0\\4\mathrm{q}-2<0\\4\mathrm{q}-2=0\end{cases}\quad \text{and to solve it}\quad B_1(q)=\begin{cases}(q>1/2)\rightarrow p=1\\(q<1/2)\rightarrow p=0\\(q=1/2\rightarrow p:0\leqslant p\leqslant 1)\end{cases}$$

For player 2's payoffs

$$-pq+p(1-q)+(1-p)q-(1-p)(1-q)=-4\mathrm{pq}+2\mathrm{p}+2\mathrm{q}-1=q(-4\mathrm{p}+2)+2\mathrm{p}-1\ .$$

To maximize for q from $q(-4\mathrm{p}+2)+2\mathrm{p}-1$ it is clear that player 2's best responses are

$$B_2(p)=\begin{cases}-4\mathrm{p}+2>0\\-4\mathrm{p}+2<0\\-4\mathrm{p}+2=0\end{cases}\quad \text{and to solve it}\quad B_2(p)=\begin{cases}(p<1/2)\rightarrow q=1\\(p>1/2)\rightarrow q=0\\(p=1/2\rightarrow q:0\leqslant q\leqslant 1)\end{cases}$$

To plot the results to a coordinate the following diagram, where player 1 is back and player 2 is gray

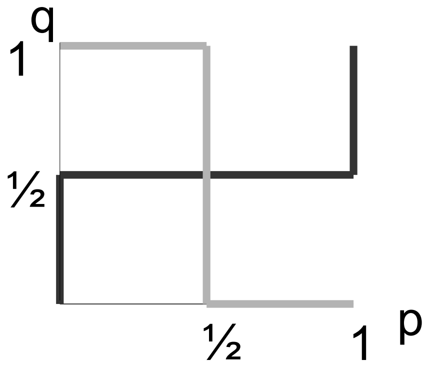

Figure 1 Players best responses

From the figure it is clear that the players best plots intersect only in one point $(p, q) = (\frac{1}{2}, \frac{1}{2})$ and that is the Nash equilibrium of this game. This means that both players should play Head with probability $\frac{1}{2}$ and Tail with probability $\frac{1}{2}$. This approach can be applied to the previous Restaurant game and a previously unknown Nash equilibrium point $(\frac{2}{3}, \frac{1}{3})$ will be the result.