1. The market for automobiles is characterized by competition in complements and in strategic complements. Many automobile manufacturers spend money to pay for industry lobbyists who work to have Congress pass uniform Federal safety standards (as opposed to allowing individual states to set their own safety standards). That is, each manufacturer can contribute to a fund used to pay for lobbyists that represent a group of manufacturers. Uniform standards tend to lower compliance costs for manufacturers.

Is investing in the lobbying fund a tough or soft commitment? Will the strategic effect associated with investment in cooperative advertising create an incentive for a manufacturer to increase or decrease its investment relative to the direct benefit lobbying provides a manufacturer?

2. Chapter 14, Answer questions 11-14 using the following stage game.

<table>
<thead>
<tr>
<th>Player 1</th>
<th>Player 2</th>
<th>Player 3: East</th>
<th>Player 3: West</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Left</td>
<td>Right</td>
<td>Left</td>
</tr>
<tr>
<td>Up</td>
<td></td>
<td></td>
<td>0,0,1</td>
</tr>
<tr>
<td>Down</td>
<td>-1,4,4</td>
<td>0,0,0</td>
<td>0,-1,0</td>
</tr>
</tbody>
</table>

3. Two firms compete by setting prices in an infinitely repeated game. The demand equation for firm 1 is

\[ q_1 = 100 - 3p_1 + p_2 \]

and the demand equation for firm 2 is

\[ q_2 = 100 - 3p_2 + p_1. \]

Each firm has a marginal cost of production equal to 5.

a. Calculate the Nash equilibrium of the stage game (i.e. the one-shot game).

b. Calculate the collusive prices of the stage game.

c. Calculate the range of discount factors for which collusive pricing can be the subgame perfect Nash equilibrium outcome of the infinitely repeated game. Clearly specify the subgame perfect equilibrium strategies needed to support collusive pricing.
d. If the per-period interest rate is 60%, can collusive pricing be a subgame perfect Nash equilibrium outcome?