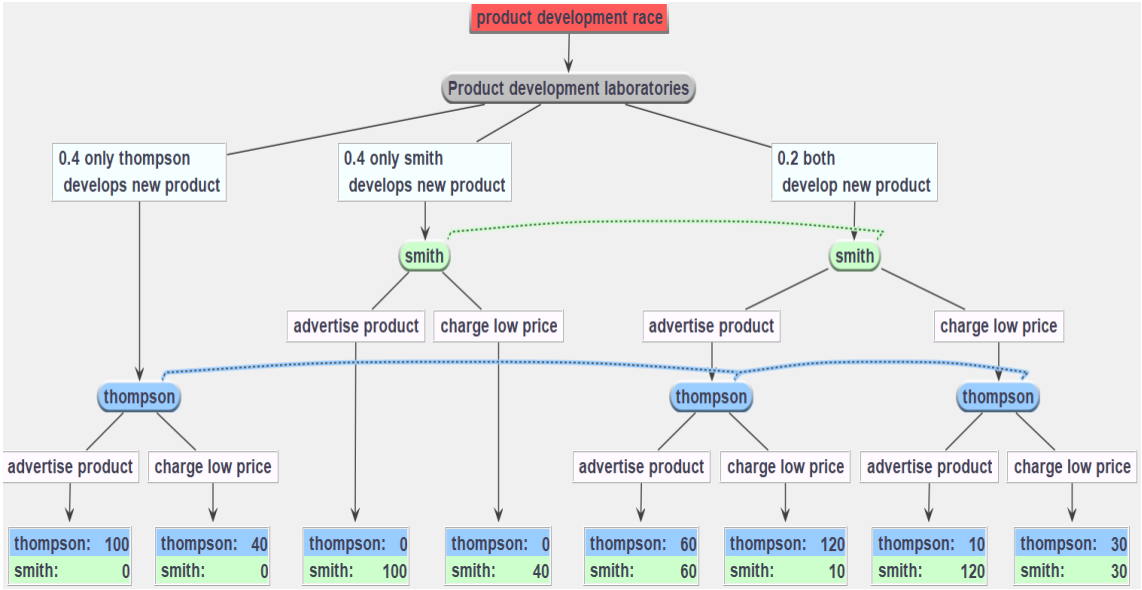
Professor Robert A. Miller
Carnegie Mellon University
Strategic Corporate Management
45-870M Second Mini 2025

ASSIGNMENT 3 (9 points)
(Due Sunday November 9)

There are three multipart questions and one experiment.

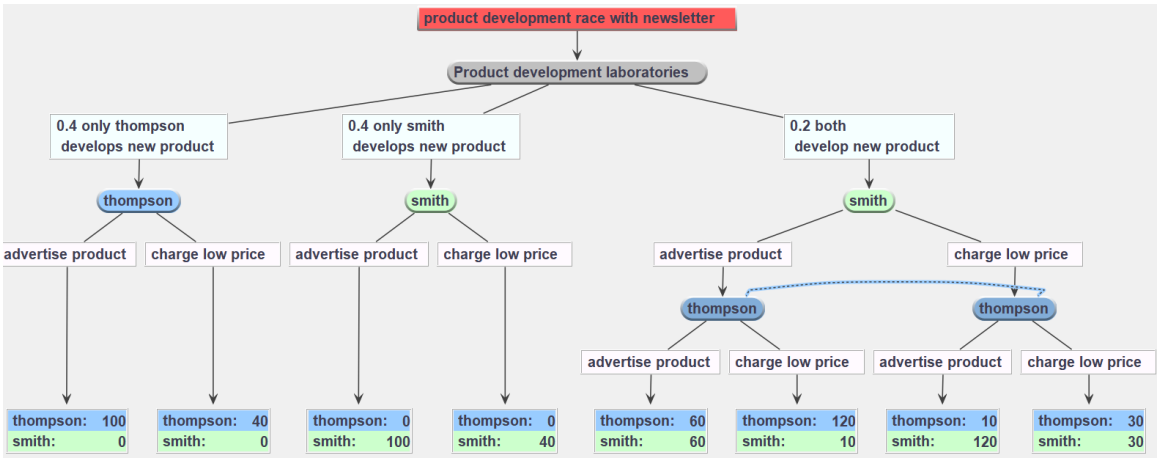
Question 1 (3 points) . . . *generic versus differential advertising*

Often companies do not know precisely how much competition they will face before launching a new product. If successful inventors know they do not face competition for their new products, then marketing the overall product characteristics to increase customer awareness could be a profitable strategy. To the extent that rivals develop similar new products, advertising overall characteristics leads some consumers to purchase rival brands; marketing in a way that differentiates the inventor's product from those of the rivals' might be more attractive.



(a) What is the strategic form? Show the matrix representation of the strategic form that we developed in class. (Use comlabgames; copy and paste the representation into your answer.)
(b) Does each firm have a dominant strategy? Illustrate your answers by showing the best replies on the matrix representation.
(c) Solve the game. What is the Nash equilibrium outcome?

Now suppose a newsletter is produced to keep firms abreast of the latest developments. Both firms become informed about who has developed the new product before they decide on a pricing and promotion move. The extensive form becomes:



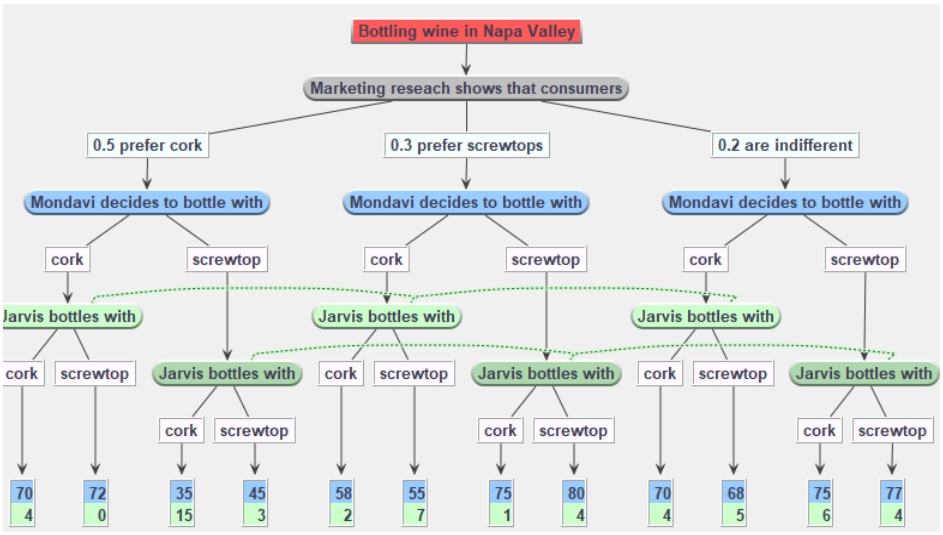
(d) If Thompson is the only firm to develop the product, it should advertise rather than choose a low price, and similarly for Smith. What happens if both firms develop the produce?

(e) Does the government have an incentive to produce such an industry newsletter? What about the firms? Briefly explain in a few sentences, by showing the expected profits of both firms, with and without the newsletter.

(f) Now suppose Smith and Thompson were two profit centers owned by the one firm! Briefly explain the value of having information silos.

Question 2 (3 points) . . . rivals as a source of *information value*

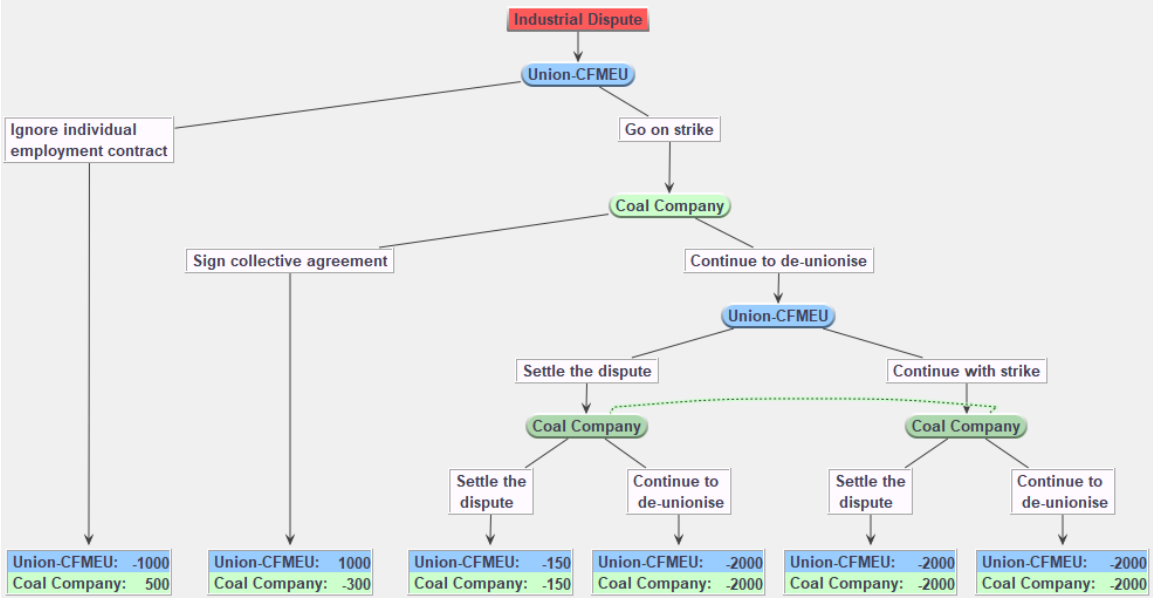
The solution to the game on bottling wine in Lecture 3 shows that rivals can be a valuable source of information. Although Jarvis could undertake its own research into bottling, it eliminates these costs by piggybacking off Mondavi's extensive marketing research. However, Jarvis receives a noisy signal from Mondavi. Jarvis cannot tell whether consumers prefer screwtops or are indifferent. This question investigates much would Jarvis be prepared to pay to conduct its own research and receive a clear signal.



(a) Suppose Jarvis obtains the information that Mondavi has (by buying the report produced for Mondavi, doing its own research, or through industrial espionage). How would that change the game tree illustrated above?
(b) Solve for the perfect information game you defined in part (a).
(c) What is the value to Jarvis from obtaining the information Mondavi has at the same time Mondavi does?
(d) What is the maximum amount Jarvis would be willing to pay for this research report?
(e) What is the value to Jarvis from obtaining the information Mondavi obtained if and when Mondavi bottles with screwtops but before Jarvis commits to cork or screwtops?
(f) Explain the difference between your answers in parts (c) and (e)?
(g) What is the minimum amount Mondavi would offer to share the results of the market research? Explain your reasoning.
(h) Are there potential gains from trade to Mondavi selling the research to Jarvis? Why or why not?

Question 3 (3 points) . . . *industrial dispute*

This game is based on an episode in the coal mining history of Australia. A consortium of employers (coal company) tried to break up the union (Union-CFMEU). They tried to break up the union by making individual agreements with miners in different regions. This would prevent the unions from cross subsidizing the miners working in the older less profitable regions (in the Hunter valley near Sydney) with company profits obtained from the most profitable ones (located in the remote outback of Western Australia). Here is the extensive form game:



(a) Run this game within your **experimental group** four or more times, paste a snapshot into your answers, report the empirical distribution and the best replies to the empirical distribution.
(b) What are the strategies of each player? *(Hint: One strategy of the Union is to first go strike and then if the coal company continues to de-unionize continue with strike.)*
(c) Use comlabgames to show the strategic form (labelling players, strategies and cell payoffs).
(d) Use arrows to illustrate the best responses of both players.
(e) Solve the strategic form of the game. How many pure strategy Nash equilibria are there?
(f) Now solve the subgame that begins when the Union makes its second move.
(g) Form a reduced game in extensive form by plugging the solution payoff from part (e) into the node where the union is making its second move.
(h) Use backwards induction to solve the reduced game in extensive form.
(i) Noting that your answer to in (g) corresponds to one of the Nash equilibria derived in (d), explain why one of the equilibria might give the most plausible prediction.
(j) Based on your analysis above, explain why players who make incredible threats, sometimes portray themselves as slightly crazy?
(k) Is it rational for shareholders to employ a slightly crazy CEO, who might love a fight for its own sake, or more generally with payoffs that are different from the firm's? Briefly explain and illustrate.