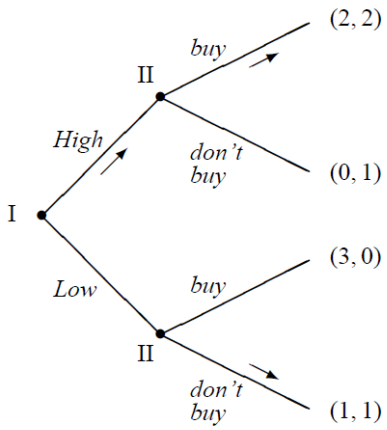
# Question 30 - Backward Induction

The service provider, player I, makes the first move, choosing High or Low quality of service. Then the customer, player II, is informed about that choice. Player II can then decide separately between buy and dont buy in each case. The resulting payoffs are depicted on the tree.




## Solution

- This technique solves the game by first considering the last possible choices in the game. Here, player II moves last. Since she knows the play will end after her move, she can safely select the action which is best for her.
  - If player I has chosen to provide high quality service, then the customer prefers to buy, since her resulting payoff of 2 is larger than 1 when not buying.
  - If the provider has chosen Low, then the customer prefers not to purchase.
- These choices by player II are indicated by arrows. Once the last moves have been decided, backward induction proceeds to the players making the next-to-last moves (and then continues in this manner).
- Player I makes the next-to-last move, which in this case is the first move in the game. Being rational, he anticipates the subsequent choices by the customer.
- He therefore realizes that his decision between High and Low is effectively between the outcomes with payoffs (2; 2) or (1; 1) for the two players, respectively.
- Clearly, he prefers High, which results in a payoff of 2 for him, to Low, which leads to an outcome with payoff 1.
- **OUTCOME** So the unique solution to the game, as determined by backward induction, is that player I offers highquality service, and player II responds by buying the service.