

### **What do you understand by prisoner's dilemma? Give example.**

The prisoner's dilemma was developed in 1950 by RAND Corporation mathematicians Merrill Flood and Melvin Dresher during the Cold War. It is a imaginary situation employed in game theory.

A prisoner's dilemma describes a situation where, according to game theory, two players acting selfishly will ultimately result in sub optimal choice for both. It also shows us that mere co-operation is not always in one's best interest.

E.g., two prisoners are accused of a crime. If one confesses and the other does not, the one who confesses will be released immediately and the other will spend 20 years in prison. If neither confesses, each will be held only a few months. If both confess, they will each be jailed 15 years.

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**Incentive compatibility**, is a state in game theory and economics that occurs when the incentives that motivate the actions of individual participants are consistent with following the rules established by the group.

**Positive-sum game**, in game theory, a term that refers to situations in which the total of gains and losses is greater than zero. A positive sum occurs when resources are somehow increased and an approach is formulated in which the desires and needs of all concerned are satisfied. One example would be when two parties both gain financially by participating in a contest, no matter who wins or loses.

### **Write a short note on Nash Equilibrium**

A key element of game theory is the concept of **Nash equilibrium**. The concept was developed by John Nash, an American mathematician who was awarded the 1994 Nobel Prize in economics for this work.

A Nash equilibrium occurs when no player has an incentive to change their decision, taking into account what the players have decided and assuming the other players don't change their decisions. Thus, all players have made an optimal decision, given the decisions of the other players.

#### **Game theory:**

It is a branch of mathematics that economists use to analyze situations in which players must make decisions and then receive payoffs based on what decisions the other players make

**Kinked demand curve:**

It is a perceived demand curve that arises when competing oligopoly firms commit to match price cuts, but not price increases