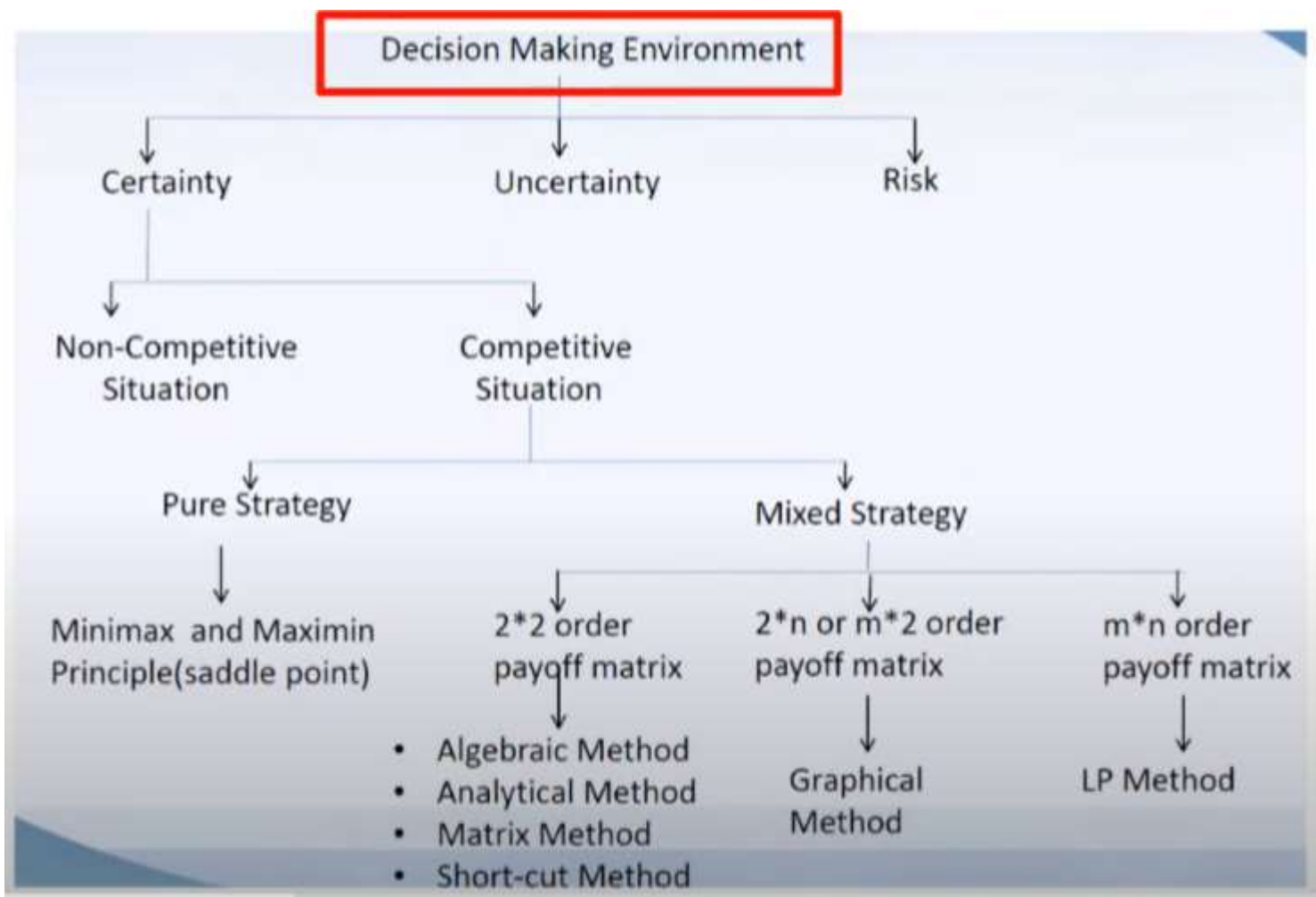




Types of Games strategies

Game theory participants can decide between a few primary ways to play their game. In general, each participant must decide what level of risk they are willing to take and how far they are willing to go to pursue the best possible outcome.



Classification of Game strategies

- **Two-Person Game** - A game with 2 number of players.
- **Zero-Sum Game** - A game in which sum of amounts won by all winners is equal to sum of amounts lost by all losers.
- **Non-Zero Sum Game** - A game in which the sum of gains and losses are not equal.
- **Pure-Strategy Game** - A game in which the best strategy for each player is to play one strategy throughout the game.



- **Mixed-Strategy Game** - A game in which each player employs different strategies at different times in the game.

Types of Game Theory

Cooperative vs. Non-Cooperative Games

Although there are many types of game theory, such as symmetric/asymmetric, simultaneous/sequential, and so on, cooperative and non-cooperative game theories are the most common.

Cooperative game theory deals with how coalitions, or cooperative groups, interact when only the payoffs are known. It is a game between coalitions of players rather than between individuals, and it questions how groups form and how they allocate the payoff among players.

Non-cooperative game theory deals with how rational economic agents deal with each other to achieve their own goals. The most common non-cooperative game is the strategic game, in which only the available strategies and the outcomes that result from a combination of choices are listed. A simplistic example of a real-world non-cooperative game is rock-paper-scissors.

Zero-Sum vs. Non-Zero-Sum Games

When there is a direct conflict between multiple parties striving for the same outcome, it is often called a zero-sum game. This means that for every winner, there is a loser. Alternatively, it means that the collective net benefit received is equal to the collective net benefit lost. Lots of sporting events are a zero-sum game as one team wins and another team loses.

A non-zero-sum game is one in which all participants can win or lose at the same time. Consider business partnerships that are mutually beneficial and foster value for both entities. Instead of competing and attempting to win at the expense of the other, both parties benefit.

Investing and trading stocks is sometimes considered a zero-sum game. After all, one market participant buys a stock and another participant sells that same stock for the same price. However, because different investors have different risk appetites and investing goals, it may be mutually beneficial for both parties to transact.

Simultaneous Move vs. Sequential Move Games

Simultaneous move situations, which occur frequently in life, mean each participant must continually make decisions at the same time that their opponent is making decisions. As companies devise their marketing, product development, and operational plans, competing companies are doing the same thing at the same time.

In some cases, there is an intentional staggering of decision-making steps, enabling one party to see the other party's moves before making their own. This is usually present in negotiations; one party lists their demands, then the other party has a designated amount of time to respond and list their own.



One Shot vs. Repeated Games

Game theory can begin and end in a single instance. Like much of life, the underlying competition starts, progresses, ends, and cannot be redone. This is often the case with equity traders, who must wisely choose their entry point and exit point, as their decision may not easily be undone or retried.

On the other hand, some repeated games continue on and seemingly never end. These types of games often contain the same participants each time, and each party has the knowledge of what occurred previously.

For example, consider rival companies trying to price their goods. Whenever one makes a price adjustment, so may the other. This circular competition repeats itself across product cycles or sale seasonality.

Maximax Strategy

A maximax strategy involves no hedging. The participant is either all in or all out; they'll either win big or face the worst consequence. Consider a new start-up company introducing new products to the market.

Its new products may result in the company's market cap increasing fifty-fold. On the other hand, a failed product launch will leave the company bankrupt. The participant is willing to take a chance on achieving the best outcome even if the worst outcome is possible.

Maximin Strategy

A maximin strategy in game theory results in the participant choosing the best of the worst payoff. The participant has decided to hedge risk and sacrifice full benefit in exchange for avoiding the worst outcome.

Often, companies face and accept this strategy when considering lawsuits. By settling out of court and avoiding a public trial, companies agree to an adverse outcome. However, that outcome could have been worse if the case had gone to trial.

Dominant Strategy

In a dominant strategy, a participant performs actions that are the best outcome for the play, irrespective of what other participants decide to do. In business, this may be a situation where a company decides to [scale](#) and expand to a new market, regardless of whether a competing company has decided to move into the market as well. In Prisoner's Dilemma, the dominant strategy would be to confess.

Pure Strategy

Pure strategy entails the least amount of strategic decision-making, as pure strategy is simply a defined choice that is made regardless of external forces or actions of others.

Consider a game of rock-paper-scissors in which one participant decides to throw the same shape with each trial. As the outcome for this participant is well-defined in advance (outcomes are either a specific shape or not that specific shape), the strategy is defined as pure.



Mixed Strategy

A mixed strategy may seem like random chance, but there is much thought that must go into devising a plan of mixing elements or actions.

Consider the relationship between a baseball pitcher and batter. The pitcher cannot throw the same pitch each time. Otherwise, the batter could predict what would come next. Instead, the pitcher must mix their strategy from pitch to pitch to create a sense of unpredictability that they hope to benefit from.

Eg: S1= Invest in TV Advertising S2= Invest in Digital Marketing S3= Invest in Celebrity Endorsement

Pure Strategy	Mixed Strategy
<ul style="list-style-type: none">• Probability of S1 = 0• Probability of S2 = 1• Probability of S3=0 Total=1	<ul style="list-style-type: none">• Probability of S1 = 1/4• Probability of S2 = 0• Probability of S3 = 3/4 Total=1