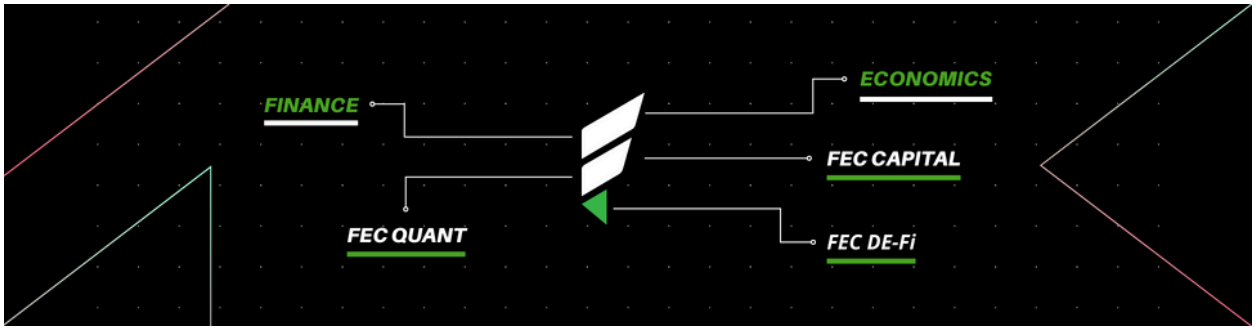


# GAME THEORY PROJECT

Hello everyone!

Hope you are doing well. You would have made a good understanding of finance till now. Let us now look at an important topic in Economics : "*Game Theory*". This would be the first project of the club, as well as the first project for the majority of you. Before deep diving further, see these introductory videos/blogs.

**1.) What is Game Theory?**

Video-

How Decision Making is Actually Science: Game Theory Explained

Blog- https://www.investopedia.com/terms/g/gametheory.asp

**2.) What is Nash Equilibrium?**

Video- https://intellipaat.com/blog/nash-equilibrium/

Blog- Prisoners' dilemma and Nash equilibrium | Microeconomics | K…

**3.) What is the best response function?**

Video 1- GTO-1-07: Best Response and Nash Equilibrium

Video 2- Game Theory 101 (#6): Best Responses

One of the major topics that is widely studied in Game Theory is Economic Modes that defines a relation between Demand, Supply and Price of goods.

We have two major types of these models:

1.) **Cournot Duopoly model**

Video- Cournot Competition | Microeconomics by Game Theory 101
Blog- https://inomics.com/terms/cournot-competition-1525473

2.) **Bertrand Duopoly Model**

Video- Bertrand Competition | Microeconomics by Game Theory 101
Blog- https://inomics.com/terms/bertrand-competition-1504578

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## Project Description

Team should form a distinct game corresponding to each model. Then the teams must conduct the live experiments by playing out these two games for any set of participants.

**NOTE: The teams are the experimenters; the participants can be their friends & family. If you are comfortable with coding in python, C or C++ you can use it to generate random data with appropriate constraints. (*Python is preferable*.)**

For example, suppose a team created two games (one for the Cournot Model and another on Bertrand Model). They decide to play these two games for one of the squad members' 5-person families. The data from these five people for these two

games were collected and recorded in order to analyze further and draw conclusions.

The games should be played as frequently as possible to ensure a representative sample size. The data gathered should subsequently be examined and appropriate conclusions drawn. Make a **report** about it.

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## REPORT DESCRIPTION

- Name, Email, and roll numbers of all the team members
- Theory about the two economic models
- A detailed explanation of the two games (rules, mathematics involved)
- Assumptions while analyzing the data
- Link to the spreadsheet with data
- Code link (if applicable)
- Outcomes of the experiment
- The best strategy to play the games
    - If all players **play optimally**
    - If players **do not play optimally**
- Conclusions drawn

**NOTE:**

1. Use google collab or Jupyter Notebooks if you are writing code.
2. Submit the final report in PDF format only.
3. Teams of 1 to 3 members.
4. Add code links/spreadsheets in PDF only.

Final submission link - Deadline 20th August, 2024