Short Answer – I

A teacher curves the final exam such that the top half of students get an A and the bottom half an F (so their grade depends only on relative and not absolute performance).  Suppose that there are equal numbers of two groups, the Brainiacs and the Numbskulls.  If they both study or they both party, the Brainiacs will get the As but if the Brainiacs party and the Numbskulls study, the Numbskulls will get the As. Suppose further that they both dislike studying and both like good grades.  Suppose all students of a type choose the same action (so we can view it as a two-player game).  The payoff matrix is

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **Numbskulls** | |
|  |  | Study | Party |
| **Brainiacs** | Study | 5,  0 | 4,  2 |
| ​  ​ | Party | 2,  5 | 7,  2 |

Assume that the game is simultaneous.

1. Briefly describe the pure Nash equilibrium and conclude if the game concludes with a pure strategy Nash equilibrium.
2. Briefly describe what a mixed-strategy Nash equilibrium is. Describe the best-response functions of both players in a mixed-strategy game. Calculate the mixed-strategy Nash equilibrium.

Now suppose that the game moves sequentially and Numbskulls move first.

1. Describe the game in an extensive form and find the Nash equilibrium by backward induction.