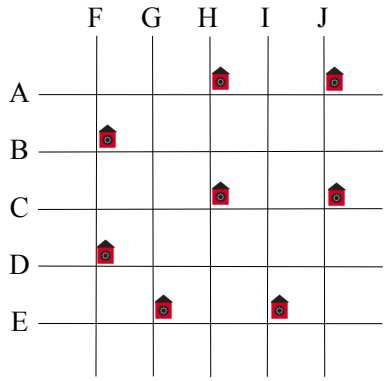
CSE 5319/6319 Homework 1

Due February 12, 5:00 p.m. on Canvas

1. List three winning moves given (3, 5, 7) as a Nim position. Show your work.

2. Give a winning move for (33, 55, 77) as a Nim position. Show your work.

3. Use Gambit and glpsol to discover Nash equilibria for the following instance of Hide and Seek.



   a. Use the streets and safehouses to directly generate a glpsol instance similar to `https://ranger.uta.edu/~weems/NOTES6319/GLPSOL/hideAndSeek.2.kp59.dat`. Use this with the model `https://ranger.uta.edu/~weems/NOTES6319/GLPSOL/2pers0sum.mod` to find one equilibrium.

   b. Use the streets and safehouses to directly generate a Gambit instance similar to `https://ranger.uta.edu/~weems/NOTES6319/GAMBIT/NOTES01/hideAndSeek.2.kp59.gbt`. How many equilibria are there?

   c. How many maximum matchings are there? (From 3.b)

4. Compute market-clearing prices and the amount of goods allocated in the following instance of Optimal Baskets of Goods via Network Flow. You should use glpsol to create and solve several instances of network flows.

   4 buyers with indicated budgets: a/$800, b/$400, c/$200, d/$100

   4 goods with indicated amounts: 0/35, 1/75, 2/35, 3/15

   Access to goods:

   a: 0, 3 b: 0, 1 c: 1, 2 d: 2, 3

5. Compute all Nash equilibria (Gambit) with payoffs, along with correlated and coarse correlated equilibria (glpsol) for the following bimatrix game:

(10, 0)	(-100, 0)	(-100, 1)
(-100, 0)	(1, 0)	(-100, -1)