CSE 5319/6319 Homework 1

Due February 22, 5:00 p.m. on Canvas

1. List three winning moves given (10, 18, 24, 46, 53) as a Nim position.

2. KP p. 51, problem 2.11 using Gambit and glpsol with `corrEq.mod` and `coarseCorrEq.mod` in `https://ranger.uta.edu/~weems/NOTES6319/GLPSOL/` to observe correlated and coarse correlated equilibria.

3. KP p. 94, problem 4.3 modified as below.

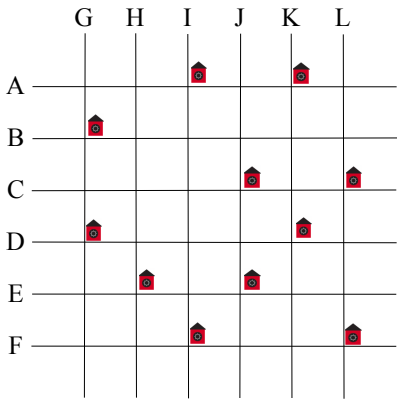
   Consider the following game:

		player II	
		C	D
player I	A	$(6, -10)$	$(0, 10)$
	B	$(4, 1)$	$(1, 0)$

   - Show that this game has a unique mixed Nash equilibrium.

   - Use glpsol with `corrEq.mod` and `coarseCorrEq.mod` in `https://ranger.uta.edu/~weems/NOTES6319/GLPSOL/` to observe correlated and coarse correlated equilibria.

4. 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`.
(Be patient! There are 7 equilibria.)

c. Compute a minimum line-cover (player 1) and a maximum matching (player 2) to obtain a Gambit instance similar to
`https://ranger.uta.edu/~weems/NOTES6319/GAMBIT/NOTES01/hideAndSeek.1.kp59.gbt`.

5. Compute market-clearing prices and the amount of goods allocated in the following instance of Optimal Baskets of Goods via Network Flow. Be sure to show details of the binary searches and the network flows.

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

   4 goods with indicated amounts: 0/20, 1/10, 2/80, 3/40

   Access to goods:

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

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

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

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