1. Gung, Mog and Pok are on a hunting expedition. Gung is strong, Mog is quick, and Pok has endurance. There is a limited supply of different types of game. They can hunt independently or in coalitions. You have to decide what coalitions would be most optimal, which would be stable, and how any coalitions that form might divide their catch afterwards. The payoffs are given below:

Coalition Structure	Payoff
GMP	(5)
GM,P	(4),(0)
GP,M	(3),(1)
PM,G	(3),(0)
G,M,P	(2),(1),(1)

   (a) In the coalition GMP is the allocation (3,1,1) stable? How about (2,2,1)?

   (b) Which coalition structures are in the solution set? What are the possible allocations?

   (c) What are the stable coalitions? What are the possible allocations that insure stability? What is the Core of the game?

2. Here is a reminder of a problem you solved in last weeks workshop. Two gamblers, Slim and Harry, wish to meet up in one of two illegal gambling halls in town (the Bar and the Garage), however they need to choose independently, otherwise Policeman Pete will get word, break up the gambling and lock them up. This is a three player game, with each player deciding whether to go to the Bar or Garage. The best outcome for Pete is if he arrives at a Bar or Garage and finds Slim and Harry there. This counts as a payoff of 2 for Pete and -1 each for Harry and Slim. Slim and Harry prefer to meet at the same place, and have Pete go to the other place. This give them each a payoff of 2 and Pete a payoff of -1. If Slim and Harry end up at different places they each get a payoff of 0, and Pete gets a payoff of 1, since no illegal gambling took place.

(a) In this game we will assume that side payments are possible between coalition partners. Can you think of any circumstances where this assumption might be valid in this game? Explain.

(b) Find the expected payoffs if they each toss a coin independently to determine which place to go (hint: each of the eight possible outcome will be equally likely).

(c) Based on your work from last week, show that payoffs for the coalitions are as follows, explain what coordinated strategies the players are playing to obtain the given payoffs, and what social role each of the players are playing in the coalition.

Coalition Structure	Payoff
PHS	(3)
P,HS	(0.5),(1)
H,PS	(-0.5),(0)
S,PH	(-0.5),(0)
P,S,H	(0.75),(0.25),(0.25)

(d) What is the solution set for this game, what are the stable coalitions? What is the core?

(e) What is the least Pete will take as a bribe to stay in the grand coalition? What is the most he can ask for?

(f) Suppose Pete is honest and doesn't take bribes, what is the least he can to offer Slim to join him in a coalition against Harry? Is it Pete's interest to do this?