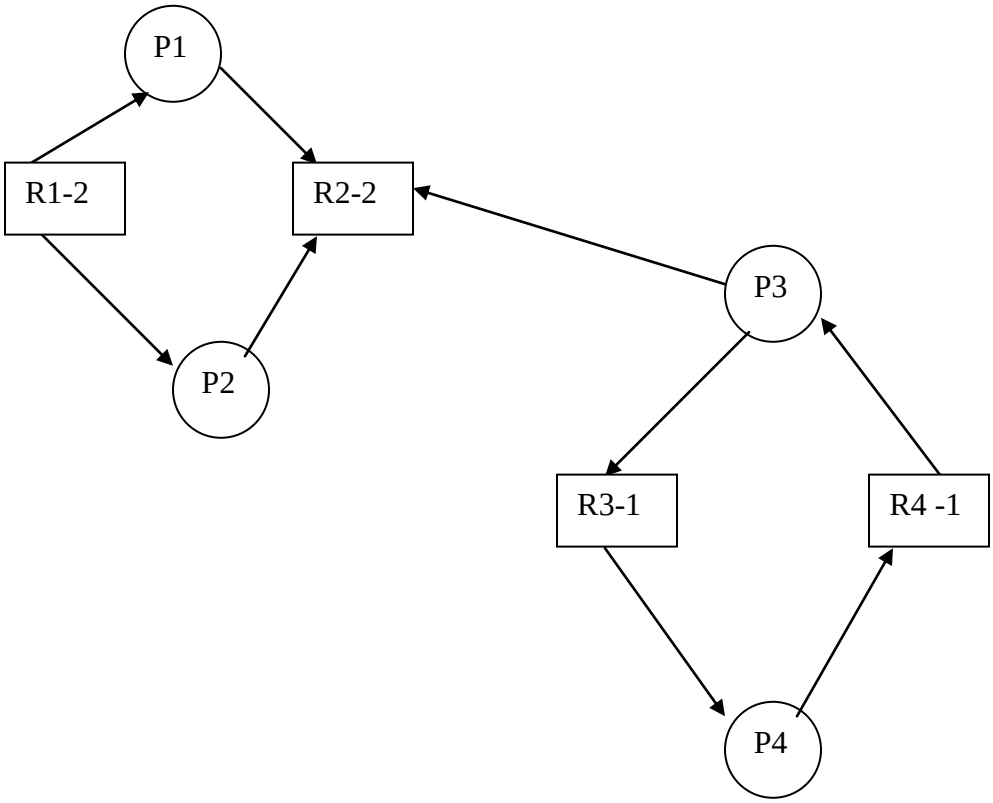
2013 Spring, COMP4100 Homework – 10(4/15) Name: Due data 4/22

1. What are the major differences between deadlock and starvation?

2. Consider the directed resource graph given below. (R1-2 means Resource 1 has 2 units of non-sharable resource.)
   a. Is this system, as a whole, deadlocked?
   b. Are there any deadlocked processes?
   c. Three processes are requesting resources from R2.
      i. Which requests would you satisfy to minimize the number of processes involved in the deadlock?
      ii. Which requests would you satisfy to maximize the number of processes involved in deadlock?
   d. Can the graph be reduced partially or totally?
   e. Can the deadlock be resolved without selecting a victim?



3. For the three systems described in I – III below, given that all of the devices are of the same type, consider applying Banker's Algorithm to answer these questions:

a. Determine the remaining needs for each job in each system.
b. Determine whether each system is safe or unsafe.
c. If the system is in a safe state, list the sequence of requests and releases that will make it possible for all processes to run to completion.
d. If the system is in an unsafe state, show how it's possible for deadlock to occur.

I. System I has 12 devices; only 1 is available.

Job No.	Devices Allocated	Maximum Required	Remaining Needs
1	5	6	
2	4	7	
3	2	6	
4	0	2	

II. System II has 14 devices; only 2 are available.

Job No.	Devices Allocated	Maximum Required	Remaining Needs
1	5	8	
2	3	9	
3	4	8	

III. System III has 12 devices; only 2 are available.

Job No.	Devices Allocated	Maximum Required	Remaining Needs
1	5	8	
2	4	6	
3	1	4	

4. Problem 9 on page 206, in Textbook.