

CSC 262

Homework #8

Due at the start of class on Wednesday, April 11.

1. **Deadlock Avoidance.** You are an international banker, lending euros, yen, and dollars. Assume that at a particular point in time, the bank's loan situation looks as shown in the table below. Note that a customer will only return the money she has been loaned if her requests in **all** currencies are met.

	euros		yen		dollars	
	loan	limit	loan	limit	loan	limit
Alice	0	0	0	12	0	0
Betty	0	9	0	0	0	0
Carol	2	13	2	13	0	1
Donna	2	3	4	5	0	1
Ethel	2	10	2	9	0	1
Bank	7		6		1	

For each scenario, decide whether or not it is safe to grant the loan requested. If it is safe, demonstrate this by giving an order in which customers' worst-case loan requests could all be satisfied. If it is not safe, give a set of legitimate concurrent requests that could break the bank. For example, the current situation is safe because Donna can be paid off, then Betty, then Ethel, then Alice, then Carol. If Ethel requests and is granted 7 euros, then the situation is unsafe, and the bank could break if the following set of requests came in: Alice – 7 yen; Betty – 1 euro; Carol – 1 euro; Donna – 1 euro; Ethel – 1 euro.

- Alice requests 6 yen.
- Betty requests 6 euros.
- Ethel requests 1 dollar.
- Carol requests 6 euros.

Only one problem this week. Use the time to prepare for the exam!