**Comp 4735 Winter 2015**

## Lab Instructor: Mirela Gutica SET : 4D

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# Lab 6

Solve the following exercises. Work in pairs. Discuss each exercise with your lab instructor.

1. Describe the paths 1- 6 from Figure 6.2.

**Path 1**

* 1. Process Q obtains resource B
  2. Process Q obtains resource A
  3. Process Q releases resource B
  4. Process Q releases resources A

**Path 2**

1. Q obtains B
2. Q obtains A
3. Process P tries to obtain A; blocked
4. Q releases B
5. Q releases A

**Path 3**

1. Q obtains B
2. P obtains A
3. Deadlock; both process are waiting for a resource from the other.

**Path 4**

1. P obtains A
2. Q obtains B
3. Deadlock; both process are waiting for a resource from the other.

**Path 5**

1. P obtains A
2. P obtains B
3. Q tries to obtain B; blocked
4. P releases A
5. P releases B

**Path 6**

1. P obtains A
2. P obtains B
3. P releases A
4. P releases B
5. Discuss Table 6.1.

The conditions for a deadlock are mutual exclusion; hold and wait; no preemption; and circular wait. It is through circular wait, however, that makes a deadlock occur.

**Mutual exclusion**

Only one process may use a resource at a time. No process

may access a resource unit that has been allocated to another process.

**Hold and wait**

A process may hold allocated resources while awaiting assignment

of other resources.

**No preemption**

No resource can be forcibly removed from a process holding it.

**Circular wait**

A closed chain of processes exists, such that each process holds

at least one resource needed by the next process in the chain (e.g., Figure 6.5c

and Figure 6.6).

There are three approaches for deadlock prevention.

1. Write the pseudo-code for the dinning philosophers’ problem.
2. Solve a problem with the Banker’s algorithm.
3. Solve a problem with the deadlock detection algorithm.
4. Solve problem 6.3 in textbook.
5. Solve problems 6.6; 6.12; 6.14.