Name: Stephen John T. Campilan
Course : IT1/aL – Platform Technologies
Teacher : Cyvil Dave T. Dasargo, MIT
Room : CLB2
Day : M-F
Time : 2:30-4:30PM

Lab Activity #: **3**
Chapter#:**4 & 5**
Chapter Title: **Early Memory Management**

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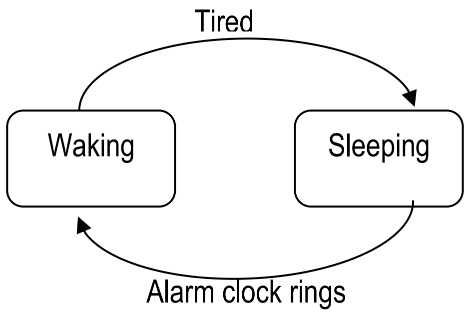
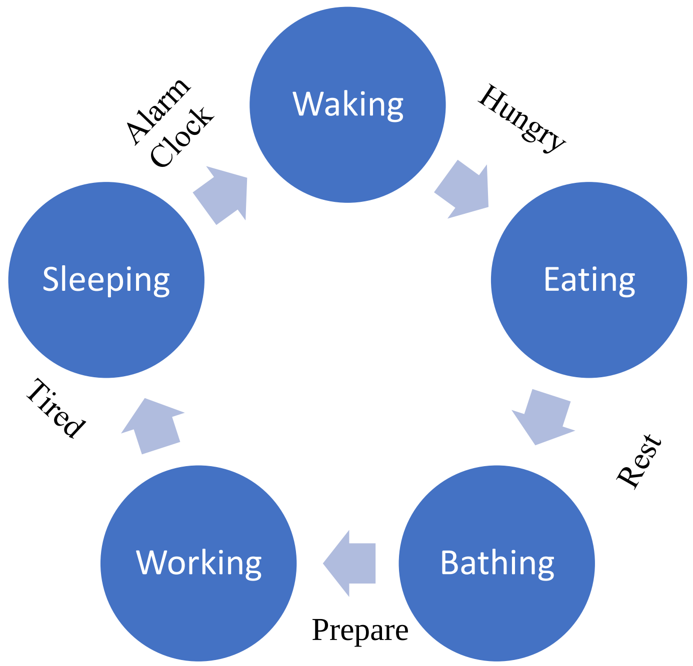
1. Figure 4.12(adapted from Madnick & Donovan, 1974) is a simplified process model of you, in which there are only two states: sleeping and waking. You make the transition from waking to sleeping when you are tired, and from sleeping to waking when the alarm clock goes off.



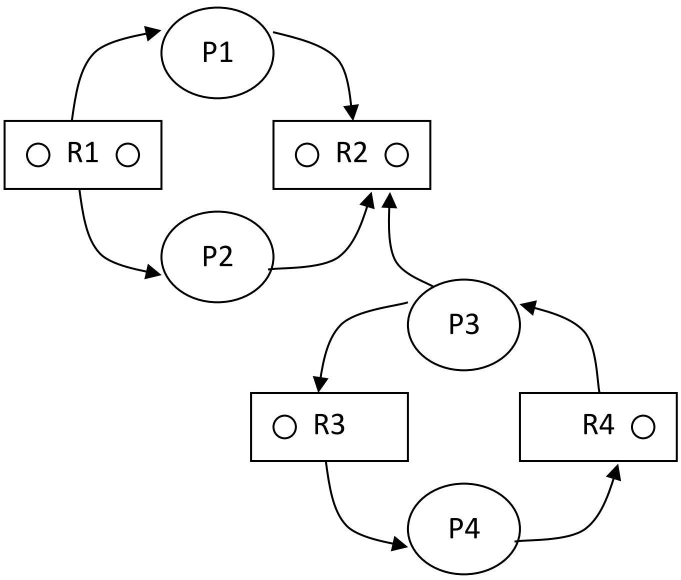
   a. Add three more states to the diagram (from example, one might be eating)



   b. State all of the possible transitions among the five states.
      i. ***Sleeping ⟹ Waking : When the alarm goes off.***
      ii. ***Waking ⟹ Sleeping : When you are tired.***

iii. ***Waking ⟹ Eating : When you are hungry.***
iv. ***Eating ⟹ Bathing : When you are done resting.***
v. ***Waking ⟹ Bathing : When you are eating.***
vi. ***Bathing ⟹ Working : When you done preparing your things.***
vii. ***Working ⟹ Sleeping : When you are tired.***
viii. ***Bathing ⟹ Sleeping : When you done preparing your things.***
ix. ***Eating ⟹ Sleeping : When you are done resting.***

2. Consider the directed resource graph shown in Figure 5.18, and answer the following questions.
   a. Is this system, as whole, deadlocked? ***NO***
   b. Are there any deadlocked processes? ***YES***
   c. Three processes – P1, P2, and P3 – are requesting resources from R2.
      i. Which requests would you satisfy to minimize the number of processes involved in the deadlock? ***P1 complete and releases its resources***
      ii. Which requests would you satisfy to maximize the number of processes involved in deadlock? ***Granting resources from to P1***
   d. Can the graph be reduced, partially or totally? ***YES***
   e. Can the deadlock be resolved without selecting a victim? ***YES***



3. Given the system A as shown in the figure below, answer the following question using the Banker's Algorithm. Assumed that the system A has only 12 devices.

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

a. Determine the "remaining needs" for each job in each system?
Job 1 Maximum Required – Devices Allocated = 6 - 5 = 1
Job 2 Maximum Required – Devices Allocated = 7 - 4 = 3
Job 3 Maximum Required – Devices Allocated = 6 - 2 = 4
Job 4 Maximum Required – Devices Allocated = 2 - 0 = 2

b. Determine whether the system is safe or unsafe.
The system is Safe

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.
Job 4
Job 1
Job 3
Job 2

d. If the system is in unsafe state, show how it's possible for deadlock to occur.
Processes that have circular dependence on one another's resources may get locked. Jobs1,2, and 3 may require resources that Job 4 may not release.