CS 2422: Assembly Language and System Programming
Fall 2008
Assignment 2

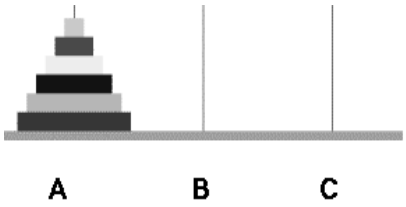
(Release on October 30, 2008)

DUE: 23:59 November 14, 2008

Goal:

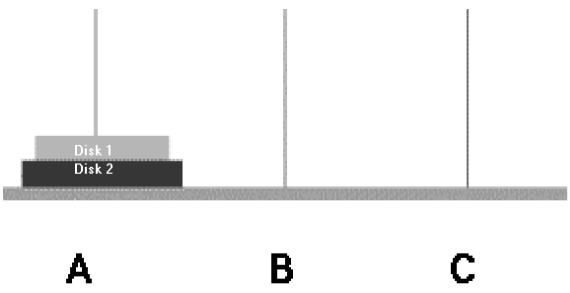
Write an assembly program to implement **Tower of Hanoi**.

Requirements:



- There are three pegs, A, B, and C, to hold the disks. All the disks originally stay at peg A and no larger disk stays on top of a smaller one. The goal of the game is to move all disks from peg A to peg C.
- The main rule for moving the disks is that a larger disk **cannot** be put on top of a smaller one at any time.
- Your program should handle an arbitrary number of disks. Name the *n* disks initially staying at peg A by 1 to *n* incrementally from top to bottom.
- At the beginning of the program, the user should input the number of disks staying at peg A. (Hint: You may need to use the function "ReadInt" in Irvine32 to read the input number of disks.)
- The output format should contain two parts. The first part should contain the **disk movement sequence**. For instance, "D1:A->B;" would mean "Disk 1 moves from peg A to peg B". After you display a movement, please do not print a line feed. A line feed will only be printed after you finish displaying the first part, and then you proceed to display the second part. The second part should contain the **step count for each disk**. For instance, "D1->C=3;" would mean "There have been 3 moving steps until disk 1 finally settles at peg C". Moreover, at the end of the second part, you should print the **total number of steps** used when all disks settle at peg C.
- An execution example is as follows:

Input: 2
Output: D1:A->B; D2:A->C; D1:B->C;
D2->C=2; D1->C=3; Total count=3.



Grading:

- (60%) A completely working program is finished.
  The code should be complete or almost done (meaning the basic structure of the code is correct but the code may still have bugs), and can be assembled correctly.
- (30%) The program produces correct results.
- (5%) Read me file.
- (5%) Readability (including comments in your program).
- Late Penalty: All assignments are due at midnight (i.e., 24:00) on the due date. The late penalty is 20% for each day (or fraction) past due.
- Early Bonus: For programming assignments, there is an early bonus of 2% per day for up to 4% total.

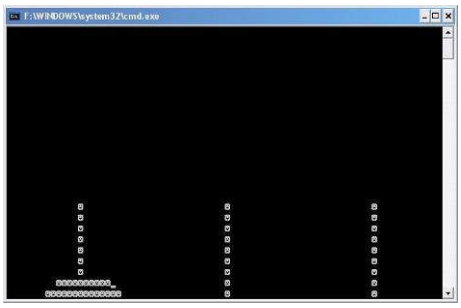
Submit your assignment:

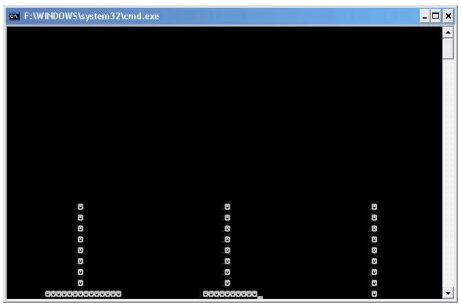
- Use ftp to enter ftp://cs2422:cs2422@140.114.79.26:2527/ under "hw2"
- Create a directory and name it with your student ID (e.g., 9600000).
  The directory should contain the following two files:
  1. The source code file. Please name this .asm file as "student ID_hw2.asm" (e.g., 9600000_hw2.asm).
  2. The "Read me" file should include: (1) the program's flow path, and (2) how to execute the program. Please name this .txt file as "student ID_hw2.txt" (e.g., 9600000_hw2.txt).
- Deadline: 11/14 23:59

Bonus:

- Show the process step by step in graphic form instead of plain text.
- You may need the "Writechar", "Gotoxy", "Delay", "Clrscr" function in Irvine32.
- You may like to reference Chapter 5 of the text book.
- You may draw graphs using the symbol represented by ASCII code '02h'.
- Bonus credit is 25%.
- Sample:

1 2





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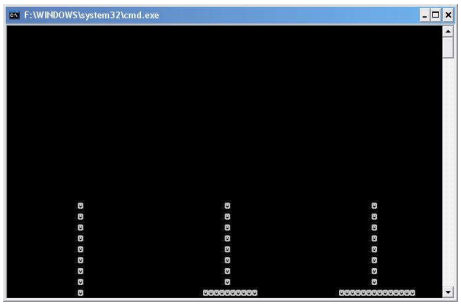

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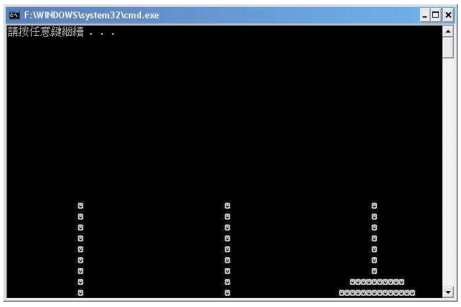

Honor Code:

Any cheating will be handled seriously in compliance with the university rules. Discussion of assignments is encouraged, but copying is prohibited and considered as cheating.