

## Programming Assignment 2 – Linux Kernel Modules

**Release Date: Feb 26, 2018**

**Due Date: March 13, 2018 (11:59pm)**

**Goal:** To give you familiarity with Linux Kernel Modules, which enable you to code for execution in kernel

**Instructions:** Follow instructions of “Chapter 2-Programming Projects-Linux Kernel Modules” on the textbook Page 96. However, I’ve changed “Part II Assignment” for new assignment requirements. The new “Part II Assignment” is as follows:

Note: Please go to <http://os-book.com/>, and use the **virtual machine** (instructions can be found on the website to install it) there for all the OS assignments, including this one.

### New Part II Assignment:

- 1) In the module entry point, create a linked list containing five *struct birthday* elements (respectively for the following people, **from head to tail: Alice, Bob, Mallory, Nancy and Kate**). Traverse the linked list and output its contents to the kernel log buffer. Invoke the *dmesg* command to ensure the list is properly constructed once the kernel module has been loaded. Please take the screen shots.  
Alice born on Feb 15, 1989;  
Bob born on April 8, 1958;  
Mallory born on Dec 12, 1958;  
Nancy born on May 9, 2004;  
Kate born on July 8, 1988;
- 2) Please sort the five *struct birthday* elements in the list by this sequence: **from head to tail, the people are from old to young**. You may need to come up with new functions if you need. Traverse the linked list again and output its contents to the kernel log buffer. Invoke the *dmesg* command to ensure the list is properly rearranged. Please take the screen shots.
- 3) In the module exit point, delete the elements from the linked list and return the free memory back to the kernel. Again, invoke the *dmesg* command to check that the list has been removed once the kernel module has been unloaded. Please take the screen shots.

**Deliverable:** Submit the following through Canvas, in a **tar-ball**:

- 1) Source files, .ko file, Makefile, and a report;
- 2) The report should contain source code, Makefile code and necessary screenshots. Please submit only an **electronic version** to Canvas.