

1 Purpose

The purpose of this assignment is to learn how to work with the Linux kernel. You will find the online book at [Linux Weekly News](#) to be of great help. Chapter two exclusively focuses on kernel modules, which is the primary task you will work on. Additionally, chapter four illustrates debugging techniques for the kernel. Other chapters will probably come in handy in future assignments.

2 Exercises

This assignment will be broken down into 2 kernel modules. You should turn in both modules, but the first is quite simple since you can find it in the online book.

2.1 Hello, world!

Create the hello world module from chapter two in the online book. This will ensure you have the proper environment set up and that you know how to create, build, and install a kernel module. Even though the code for this module appears early in the chapter, I would suggest you read through the whole chapter to ensure you understand everything you need for the next section before proceeding.

2.2 Process ID

Create a module that creates an entry in the `/proc` filesystem. This entry should uniquely identify your group members (e.g., initials of each member). This new file should contain the process ID of the process accessing it.

Since we haven't talked about creating files, yet, and the second chapter doesn't talk about the `/proc` filesystem, you may be wondering how to proceed. Fortunately, chapter four talks about creating these files for debugging purposes. Pay attention that the book mentions `/proc` should be used more for debugging purposes than general purpose. The `/sys` filesystem is better suited for this project, but understanding how to create files in it is much, MUCH more complicated.

3 Helpful hints

The device drivers online book is essential. Note that this program is very short, but will take quite a bit of reading and investigating. Allocate enough time to the project even though your final solution will not indicate much work. The work will show up in future assignments when you can quickly use the concepts you learned in this assignment.

4 Constraints

Now that you're in the Linux kernel proper, you must write exclusively in C. The module must compile on your 2.6.11+ machine. I will try to recompile and install it on my machine. If I cannot, you'll have to demonstrate the module on your system. This shouldn't be a problem for this assignment since you will not be depending on anything version specific.

5 Extra Credit (10 points)

You may implement this feature using the `/sys` filesystem instead of `/proc`.