

System Programming – Project 3 (2015-2016 Fall Term)

In this assignment, a device driver will be implemented for controlling a number of counter devices to generate ranges of integers. The device nodes will be named `"/dev/range0"`, `"/dev/range1"`, etc and each device will count independently from the others.

- Each device will have its own starting value, ending value, and step size. All of these values can be positive or negative. Step size can not be 0. Make sure that these values constitute a feasible range.
- Counting will start from the starting value for that device and every read operation will increment the counter for that device by the step size for that device. If the step size is negative, the device will count down.
- Reading from the device will result in an integer sequence where each number will be the next value in the range. For example, if the initial value is 0 and the step size is 1, reading from the device will result in the sequence `"0 1 2 3 ..."`. You can use the `od` utility for your tests, as in `"od -t d4 /dev/range0"`.
- When the ending value is reached, based on the mode of the device, the counter will either go back (rotate) to the starting value or report an end-of-file.
- The devices will support the following `ioctl` commands: `RANGE_GET_STEP_SIZE`, `RANGE_SET_STEP_SIZE`, `RANGE_GET_COUNTER` (get next number without incrementing the counter), `RANGE_SET_COUNTER` (set next number to be read), `RANGE_SET_ROTATE_MODE` (switch to rotating mode), `RANGE_SET_EOF_MODE` (switch to end-of-file mode).
- The write and seek operations will not be supported.
- A dynamic major number will be assigned for the driver.
- The default starting value, ending value and step size to be used in all devices will be module parameters.

Please read the following carefully!

- Each member of the group must make a submission, even though the submitted files may be the same for all group members.
- Group members will be graded individually based on their performance in the lab session and the submitted group project. Students who are not present during the lab session will not receive a grade for the project, even though they may have made a submission through the Ninova system.
- Any form of cheating or plagiarism will not be tolerated. This includes actions such as, but not limited to, submitting the work of others as one's own (even if in part and even with modifications) and copy/pasting from other resources (even when attributed). The submitted work should be the product of the group itself; collaboration or code sharing between different groups will also be regarded as plagiarism. Serious offences will be reported to the administration for disciplinary measures.

- Your code should not contain any leftover code you might have copy-pasted from other resources. For example, references like “scull”, “quantum”, and “qset” should not be part of your submitted homework.