**Project Title: Linux Device Driver for USB to LED subsystem**

**Summary:** LED subsytem is employed to communicate from PC to LEDs connected with AVR Atmega8 through USB.

We have used vUSB in the firmware side.

usb\_control\_msg was used to communicate echo commands.

Additionally, we have created a trigger named, 'triggerable'.

Which can be activated and deactivated using echo commands.

**Firmware:** build using Makefile given

Commands:

make clean

make all

avrdude -c usbasp -p m8 -U flash:w:main.hex

**Kernel Space Drive:** build using Makefile given

Commands:

make all

sudo insmod usbtoled.ko

**Trigger:** this module is able to add a trigger for all LEDs

Commands:

make all

sudo insmod usbtoled.ko

**To run LED project:**

Goto /sys/Class/leds/<led file name>

Commands: cat trigger //will show all triggers available along with the trigger added before

sudo chmod 777 brightness //makes brightness file editable

echo 1 > brighntess //LED on the hardware turns ON

echo 0 > brighntess //LED on the hardware turns OFF

sudo chmod 777 trigger //makes trigger file editable

echo triggerable > trigger //makes the LED sensitive to 'triggerable' trigger

//LEDs blink in a patter on the hardware

For more reference on trigger: https://elixir.bootlin.com/linux/v4.5/source/drivers/leds/trigger/ledtrig-heartbeat.c