Device driver for reading temperature from LM75A using I2C protocol

Summary:

LM75 is an industry standard temperature sensor. It has many vendors and variants. It is present on motherboard for monitoring the temperature of processor. Device driver for LM75 can be written in two ways, as a Character driver and Platform driver. In this project we used hwmon API, regmap API and i2c subsystem calls.

More about regmap API can be found here:

https://opensourceforu.com/2017/01/regmap-reducing-redundancy-linux-code/

Documentation for hardware monitoring API can be found here:
https://github.com/torvalds/linux/blob/master/Documentation/hwmon/hwmon-kernel-api.txt

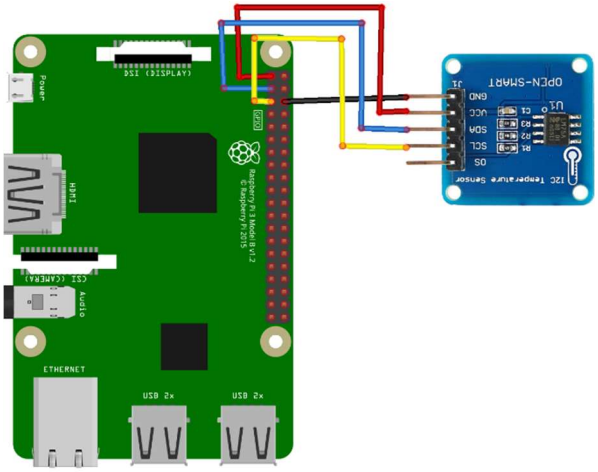
Requirements:

- Raspberry pi 2
- Memory Card with Raspbian OS
- Linux Header installed and compatible with the kernel version
- LM75A Temperature sensor
- Connecting Wires

Connections:

- Connect V_{cc} of Sensor to 3.3V pin on Raspberry pi
- Connect SCL to SCL pin on board
- Connect SDA to SDA pin on board
- Connect GND to Ground pin on board

Schematic diagram:



Actual photograph:

Testing sensor:

1. Enable I2C in Raspbian
2. Check if i2c_ dev is present using a lsmod command
3. If it does not appear run modprobe i2c_dev and check again using lsmod command
4. If it is present, run i2cdetect -y 1
5. If A0, A1, A2 are all connected to ground, the client can be seen at the address 0x48

Code compilation & viewing output:

1. Run ‘make all’ command in the folder where all the files are downloaded.
2. Run ‘sudo make install’
3. Run ‘sudo depmod -a’
4. Insert the driver module using ‘sudo insmod lm75.ko’
5. To view the output, compile ‘user.c’ file using ‘gcc user.c’ command and execute using ‘./a.out’ command

Possible errors:

1. Error while executing ‘make’ command: Check your Kernel version. This driver is written in a PC running Kernel version 4.14.79. Update your headers/Kernel.
2. Hardware connections.