RISC-V SoC and Firmware Development

Lab: 06

MAKEFILE

A **Makefile** is a file that helps you automate the process of compiling.
Instead of manually typing commands every time you want to compile your project, a Makefile lists instructions for make, a tool that runs those commands for you.

Syntax

```
target: dependencies
    command
```

- The targets can be outputs files,action or tasks.
- The dependencies are the input files or different targets on which the current target is dependant.
- The commands are the actual compiling instructions.

MAKEFILE

EXAMPLE

```
all: brom flash

$(FW_FILE): flash

brom:
	$(MAKE) -C fw/fw-brom

flash:
	$(MAKE) -C fw/fw-flash

clean:
	$(MAKE) -C fw/fw-brom clean
	$(MAKE) -C fw/fw-flash clean
```

- The **make all** command is dependant on **brom** and **flash** targets,first it will execute brom and flash targets.

FLASHING

Clone Repositry

- $ git clone https://github.com/Abdul-muheet-ghani/picotiny.git

Step01

- Modify the firmware.
- Then navigate to picotiny folder.

Step02

- Navigate to the picotiny folder and run **$ make all**

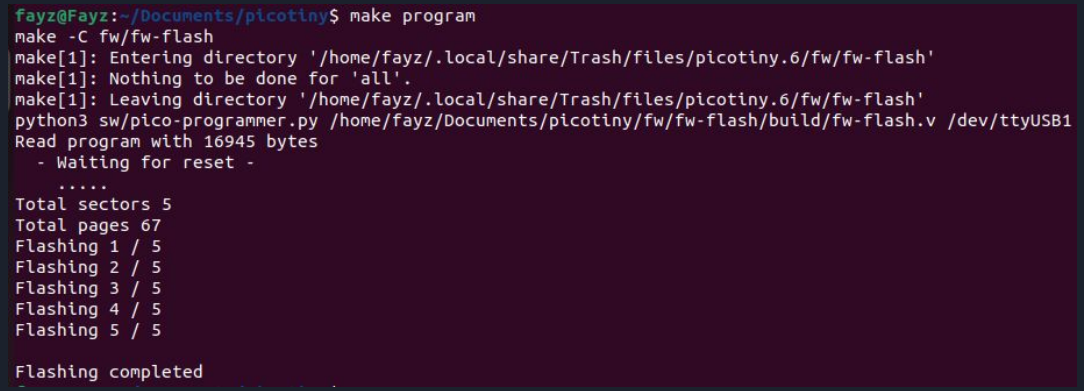
```
fayz@Fayz:~/Documents/picotiny$ make all
```

- It will convert the the firmware.c file into hex and into a verilog file.

FLASHING

Step03

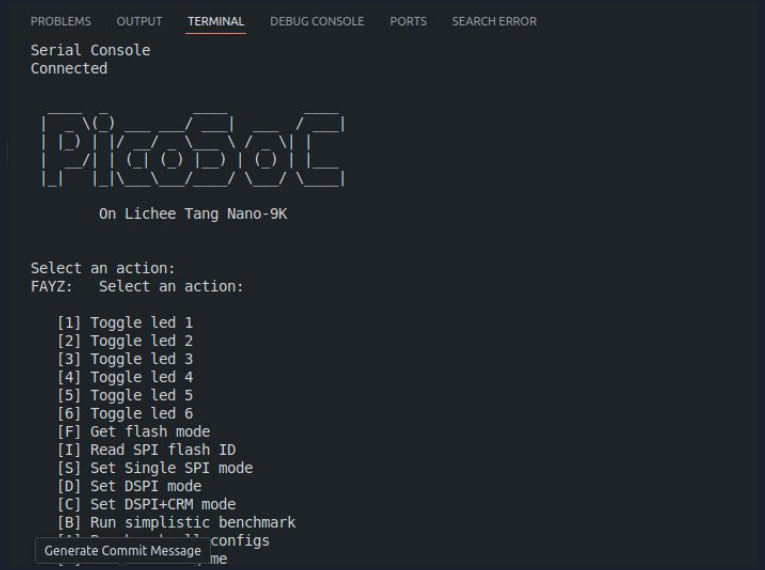
- Run the command **$make program** this will flash the verilog file onto the FPGA through **pico-programmer.py** and press the reset push button.



FLASHING

Step04

- Program the FPGA from vscode.
- Now open the serial terminal from vscode and refresh the push button of FPGA.



TASK

Customize the **firmware.c** file located in **fw/fw-flash** directory and flash it onto the FPGA.

TESTIMONIAL

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