Introduction to ARM-GCC using Pygmy

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Contents

Abstract—This document provides a simple introduction to ARM programming using Pygmy.

1 Software

All codes used in this document are available at the following link

```
https://github.com/gadepall/vaman/
    tree/master/arm/codes/setup
```

2 Setup

2.1. Connect the raspberry pi to pygmy through USB.

2.2. On the left of the USB port, an LED and a button can be seen. Another button is visible on the right of the USB port.

2.3. Press the right button and immediately press the left button. The green LED starts blinking. The pygmy is now in download mode. mode.

2.4. Open termux on android and execute the following codes

```
cd ~
svn co https://github.com/
    gadepall/vaman/trunk/arm/
    codes/setup/blink
cd GCC_Project
make
scp  output/bin/blink.bin
    pi@192.168.0.114:
```

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Appropriately modify the above ip address before sending blink.bin to the pi.

2.5. Now log on to the RPi and execute teh following

```
sudo python3 /home/pi/pygmy-dev
    /pygmy-sdk/TinyFPGA-
    Programmer-Application/
    tinyfpga-programmer-gui.py
    --port /dev/ttyACM0  --m4app
    blink.bin --mode m4-fpga
```

2.6. Enter the appropriate USB device port above while executing. Press the button to the right after the above command is successfully executed. The LED will start blinking.

3 Delay

3.1. See the following lines of the code below

```
codes/setup/blink/src/main.c
```

```
PyHal_Set_GPIO(18,1);//blue
PyHal_Set_GPIO(21,1);//
    green
PyHal_Set_GPIO(22,1);//red
    HAL_DelayUSec(2000000);
PyHal_Set_GPIO(18,0);
PyHal_Set_GPIO(21,0);
PyHal_Set_GPIO(22,0);
```

We may conclude that the blink delay is 2000 000us = 2 s.

3.2. Replace the following line in 3.1

```
HAL_DelayUSec(2000000);
```

with

```
HAL_DelayUSec(1000000);
```

and execute. Can you see any difference in the blink period?

3.3. To obtain red colour, execute the following code.

```
codes/setup/red/src/main.c
```

Now obtain blue colour.

3.4. Now obtain green colour without blink.
Solution: Execute the following code.

```
codes/setup/onoff/src/main.c
```