Embedded Linux Introduction - Assignment

1. Host setup

- The debug terminal of the board is accessed using `putty` with the following settings:

```
Category: Session
Connection type: Serial
Serial line: /dev/ttyS0
Speed: 115200
```

Note: <Serial line> can be `/dev/ttyS0` or `/dev/ttyS1`

2. How SAM9 board works?

- Go through the boot log that is printed on the console.
- Look for the kernel startup in the console log.
- Look for root filesystem mounting in the console log.

```
Using macb0 device
TFTP from server 172.16.0.2; our IP address is 172.16.1.14
Filename 'uImage-ldd'.
Load address: 0x21000000
Loading: #################################################################
         #################################################################
         #################################################################
         #################################################################
         #################################################################
         #################################################################
         #################################################################
         #################################################################
         ############
done
Bytes transferred = 2719448 (297ed8 hex)
## Booting kernel from Legacy Image at 21000000 ...
   Image Name:   Linux-3.12.22
   Image Type:   ARM Linux Kernel Image (uncompressed)
   Data Size:    2719384 Bytes =  2.6 MB
   Load Address: 20008000
   Entry Point:  20008000
   Verifying Checksum ... OK
   Loading Kernel Image ... OK
OK

Starting kernel ... ❶

Uncompressing Li done, booting the kernel.
Booting Linux on physical CPU 0x0
...
...
```

```
...
Sending DHCP requests ., OK
IP-Config: Got D:
     device=eth0, hwaddr=00:11:22:33:44:14, ipaddr=172.16.0.221,
       mask=255.255.0.0, gw=172.16.0.2 erver=0.0.0.0,
       rootserver=172.16.0.2, rootpath=
     nameserver0=172.16.0.2
VFS: Mounted root (nfs filesystem) on device 0:15. ❷
devtmpfs: mounted
```

1. Kernel start from here.
2. Root filesystem mounted.

- Go through the system initialization files `/etc` folder and understand the system boot sequence.
- List the files in `/bin` folder, and check where the symbolic links point to.
- Check the size of the root filesystem.
- Stop the boot up in U-boot and try booting with `boot` command.

3. Hello World

- Create a simple Hello World C program.
- Compile the program using `gcc` command.
- Use `file` command to find the type of the compiled binary file.
- Cross-compile the program using ARM toolchain

```
$ arm-none-linux-gnueabi-gcc -o helloworld helloworld.c
```

- Use `file` command to find the type of the cross-compiled binary file.