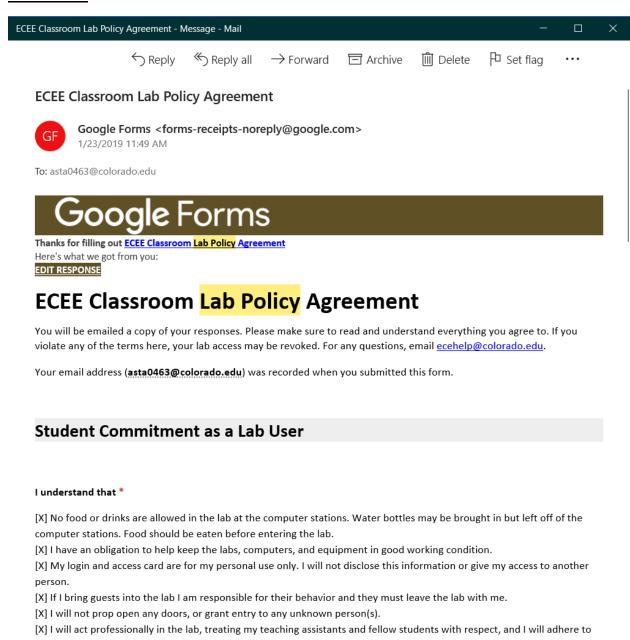
# **Advanced Embedded Software Development**

## **Homework 1**

#### -Ashish Tak

#### **Problem 1**



#### **Problem 6**

<Bash script (sysinfo.sh) and output file(log.txt) in the git repository>

#### **Problem 7**

Executing the static library version of the application:

```
ashish@Merseyside:~/Documents/Homework1/MELP/Chapter02/library/hello-arm$ ./hello-arm-static
Hello from ARM
add_ints
4 + 5 = 9
multiply_ints
4 * 5 = 20
```

Executing the shared library version of the application:

```
ashish@Merseyside:~/Documents/Homework1/MELP/Chapter02/library/hello-arm$ LD_LIBRARY_PATH=../shared ./hello-arm-shared
Hello from ARM
add_ints
4 + 5 = 9
multiply_ints
4 * 5 = 20
```

Shared library results in a lesser size (8416 vs 11232):

```
ashish@Merseyside:~/Documents/Homework1/MELP/Chapter02/library/hello-arm$ ls -l hello-arm-static -rwxr-xr-x 1 ashish ashish 11232 Jan 23 21:03 hello-arm-static ashish@Merseyside:~/Documents/Homework1/MELP/Chapter02/library/hello-arm$ ls -l hello-arm-shared -rwxr-xr-x 1 ashish ashish 8416 Jan 23 21:03 hello-arm-shared
```

Shared library usage of each executable:

```
ashish@Merseyside:~/Documents/Homework1/MELP/Chapter02/library/hello-arm$ readelf -a hello-arm-static | grep "Shared library"

8x0000000000000000 (NEEDED) Shared library: [libc.so.6]

8x00000000000001 (NEEDED) Shared library: [libtest.so]

8x00000000000000001 (NEEDED) Shared library: [libtest.so]

8x00000000000000001 (NEEDED) Shared library: [libc.so.6]

8ashish@Merseyside:~/Documents/Homework1/MELP/Chapter02/library/hello-arm$ readelf -a hello-arm-shared | grep "program interpreter"

[Requesting program interpreter: /lib64/ld-linux-x86-64.so.2]

8x1 ashish@Merseyside:~/Documents/Homework1/MELP/Chapter02/library/hello-arm$ readelf -a hello-arm-static | grep "program interpreter"

[Requesting program interpreter: /lib64/ld-linux-x86-64.so.2]
```

### **Problem 8**

Crosstool-NG toolchain for the Beaglebone Black

Version and configuration info:

```
ashish@Merseyside:~/Documents/Homework1/MELP/Chapter02/library/hello-arm/crosstool-ng$ ./ct-ng arm-cortex_a8-linux-gnueabi -v GNU Make 4.1
Built for x86_64-pc-linux-gnu
Copyright (C) 1988-2014 Free Software Foundation, Inc.
License GPLv3+: GNU GPL version 3 or later <a href="http://gnu.org/licenses/gpl.html">http://gnu.org/licenses/gpl.html</a>
This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law.
```

(Sysroot directory: ~/x-tools/arm-cortex\_a8-linux-gnueabihf/arm-cortex\_a8-linux-gnueabihf/sysroot)

Size of executables:

```
ashish@Merseyside:~/Documents/Homework1_build2/MELP/Chapter02/library/hello-arm$ ls -l hello-arm-shared
-rwxr-xr-x 1 ashish ashish 12228 Jan 25 10:40 hello-arm-shared
ashish@Merseyside:~/Documents/Homework1_build2/MELP/Chapter02/library/hello-arm$ ls -l hello-arm-static
-rwxr-xr-x 1 ashish ashish 14788 Jan 25 10:40 hello-arm-static
```

Shared library usage of each executable: