8. Cross-Compile a simple C program on the Host machine and transfer it to the Embedded Linux Board (target machine). Execute it on the board.

CREATING, COMPILING and EXECUTING FILE ON HOST

- Create a simple C program or a directory

  $ vim <filename>.c (for file)

  $ mkdir <name> (for creating directory)

- Run the program on gcc compiler on host machine (intel x86)

  $ gcc <filename>.c -o <filename>.out

- Execute the file

  $ ./<filename>.out

  (Print the output message successfully)

- Now run the program on arm linux compiler on host machine

  $ arm-linux-gnueabihf-gcc <filename>.c -o <filename>.out

- Execute the file

  $ ./<filename>.out

  (Print the error message : Exec format error)

```
desd@desd-OptiPlex-5050:~/beaglebone/staticLib$ make
make -C ARM
make[1]: Entering directory '/home/desd/beaglebone/staticLib/ARM'
arm-linux-gnueabihf-gcc -g -ggdb3 -Wall -c main.c -o main.o
arm-linux-gnueabihf-gcc -g -ggdb3 -Wall -c find_tan.c -o find_tan.o
ar rc find_tan.a find_tan.o
ranlib find_tan.a
arm-linux-gnueabihf-gcc main.o find_tan.a -g -ggdb3 -Wall -lm -static -o a.out
make[1]: Leaving directory '/home/desd/beaglebone/staticLib/ARM'
make -C GCC
make[1]: Entering directory '/home/desd/beaglebone/staticLib/GCC'
gcc -g -ggdb3 -Wall -c main.c -o main.o
gcc -g -ggdb3 -Wall -c find_tan.c -o find_tan.o
ar rc find_tan.a find_tan.o
ranlib find_tan.a
gcc main.o find_tan.a -g -ggdb3 -Wall -lm -static -o a.out
make[1]: Leaving directory '/home/desd/beaglebone/staticLib/GCC'
desd@desd-OptiPlex-5050:~/beaglebone/staticLib$ cd ARM/
desd@desd-OptiPlex-5050:~/beaglebone/staticLib/ARM$ ./a.out
bash: ./a.out: cannot execute binary file: Exec format error
desd@desd-OptiPlex-5050:~/beaglebone/staticLib/ARM$ cd ..
desd@desd-OptiPlex-5050:~/beaglebone/staticLib$ cd GCC/
desd@desd-OptiPlex-5050:~/beaglebone/staticLib/GCC$ ./a.out
my_sin = 0.21, my_cos = -0.98
tan(90.89) = -0.22
my_tan(90.89) = -0.22
```

TRANSFER DATA TO BBB BOARD

- Command to transfer secure copy of data

  $ scp -r <filename> debian@192.168.7.2:~/.

```
desd@desd-OptiPlex-5050:~/beaglebone$ scp -r staticLib/ makefile debian@192.168.7.2:~/.
Debian GNU/Linux 12

BeagleBoard.org Debian Bookworm IoT Image 2023-10-07
Support: https://bbb.io/debian
default username:password is [debian:temppwd]

debian@192.168.7.2's password:
main.c                                        100%  375    78.2KB/s   00:00
main.o                                        100%   68KB   2.1MB/s   00:00
makefile                                      100%  303    70.0KB/s   00:00
a.out                                         100% 1073KB   2.4MB/s   00:00
find_tan.a                                    100%   24KB   2.3MB/s   00:00
find_tan.o                                    100%   24KB   2.4MB/s   00:00
find_tan.c                                    100%   96    24.5KB/s   00:00
main.c                                        100%  375    87.3KB/s   00:00
main.o                                        100%   51KB   2.8MB/s   00:00
a.out                                         100%  485KB   3.6MB/s   00:00
find_tan.a                                    100%   21KB   2.4MB/s   00:00
find_tan.o                                    100%   20KB   2.2MB/s   00:00
Makefile                                      100%  328    84.7KB/s   00:00
find_tan.c                                    100%   96    21.8KB/s   00:00
Makefile                                      100%   78    18.2KB/s   00:00
makefile                                      100%  154    35.6KB/s   00:00
```

CHECK and EXECUTING FILE ON BBB board

- Checking if file/directory received or not

  $ ls

- Execute the file compile by gcc compiler

  $ ./<filename>.out

  (Print the error message : Exec format error)

- Execute the file compile by arm-linux compiler

  $ ./<filename>.out

  (Print the output message successfully)