**Lab1**

Using VersatilePB virtual board in QEMU and ARM toolchain

This is how to do this lab step by step:

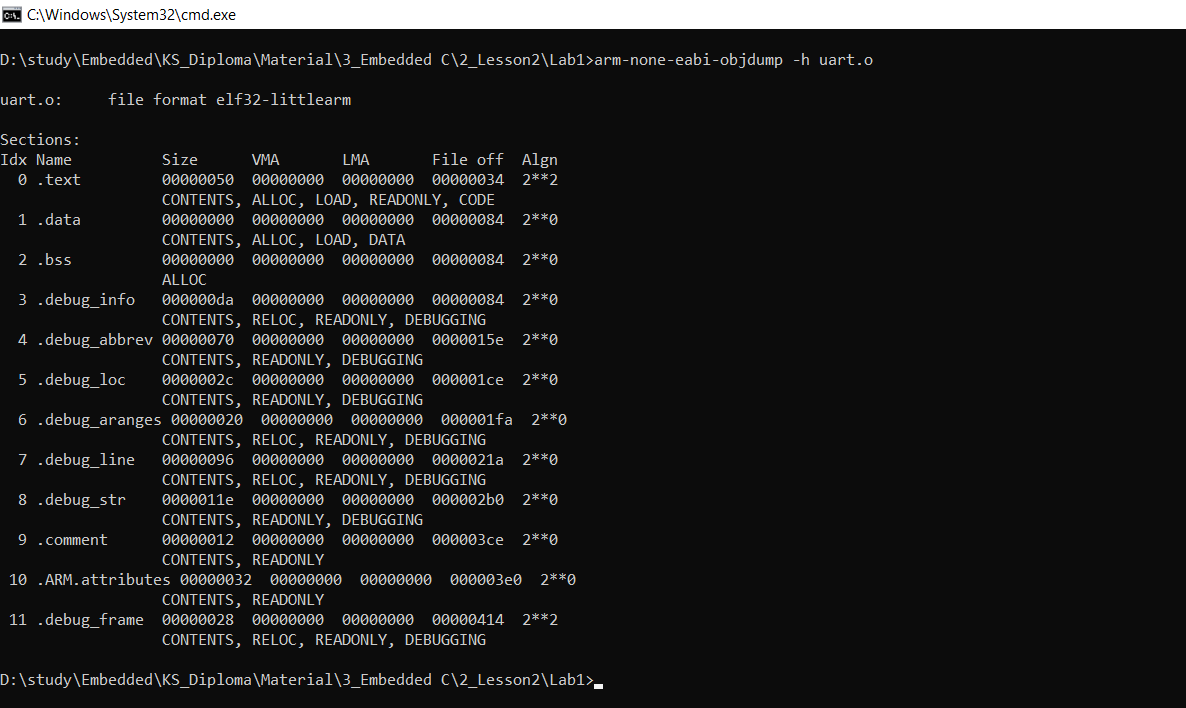
1. Writing source files, getting object files (by compiler), and analyzing them.

With Debugging:

A computer screen shot of a black screen

Description automatically generated A screenshot of a computer screen

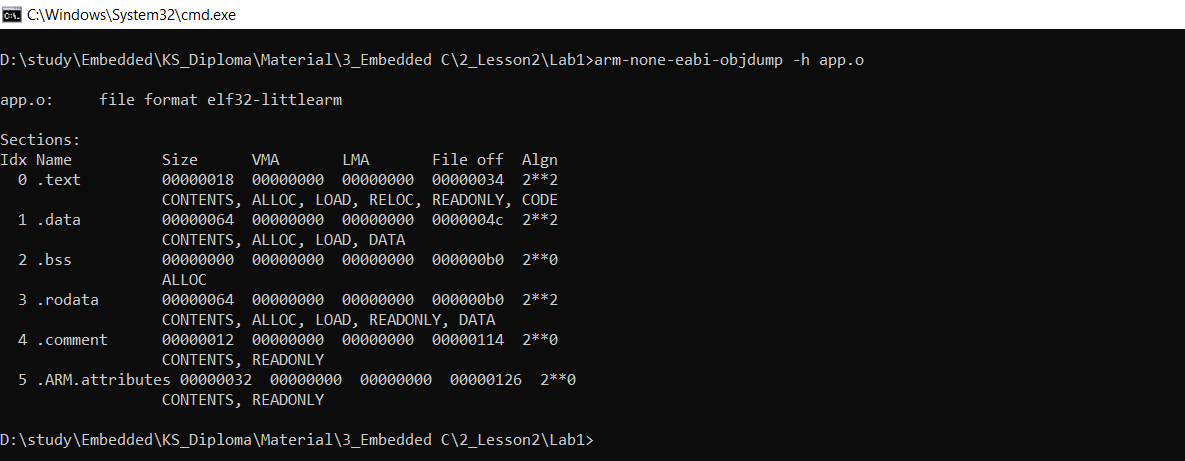
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Without Debugging:

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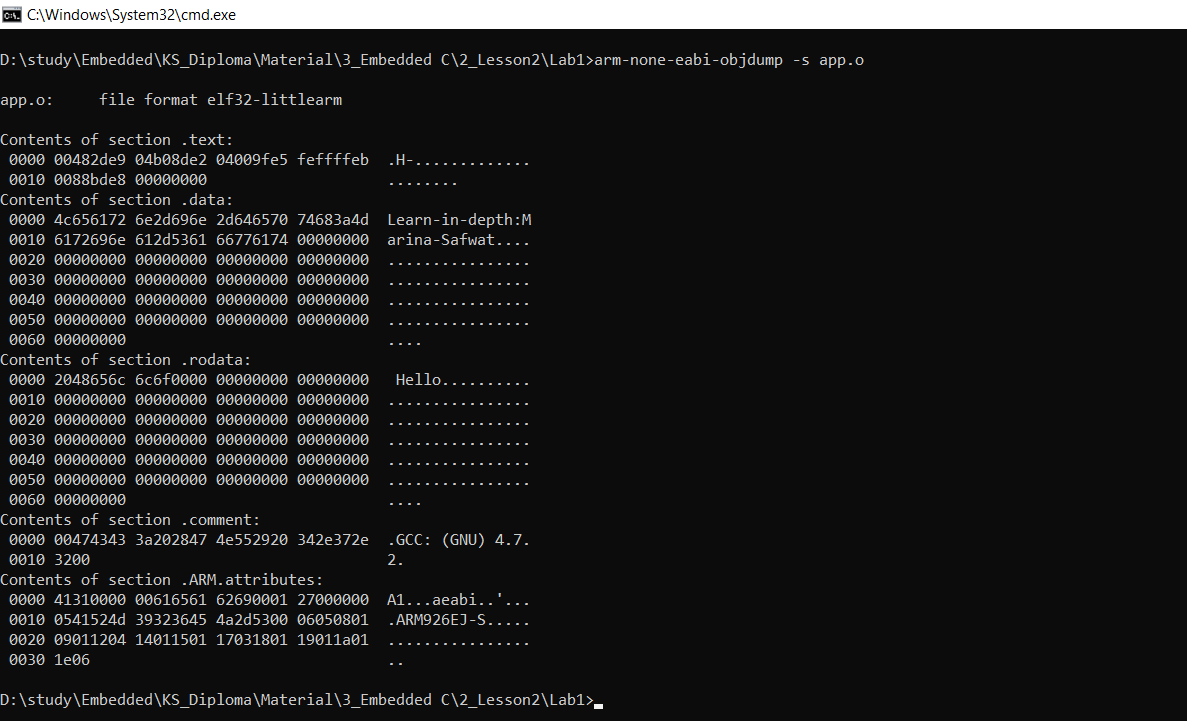
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A screen shot of a computer

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To get each section content:



To get the assembly of object file

A computer screen shot of text

Description automatically generated

A screenshot of a computer program

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1. Writing startup code, getting object files (by assembler), and analyzing it.

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A computer screen shot of a black screen

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1. Writing the linker script, linking all objects (by linker), getting the elf file (.map file has all information about .elf file) and analyzing it.

A computer screen shot of a black screen

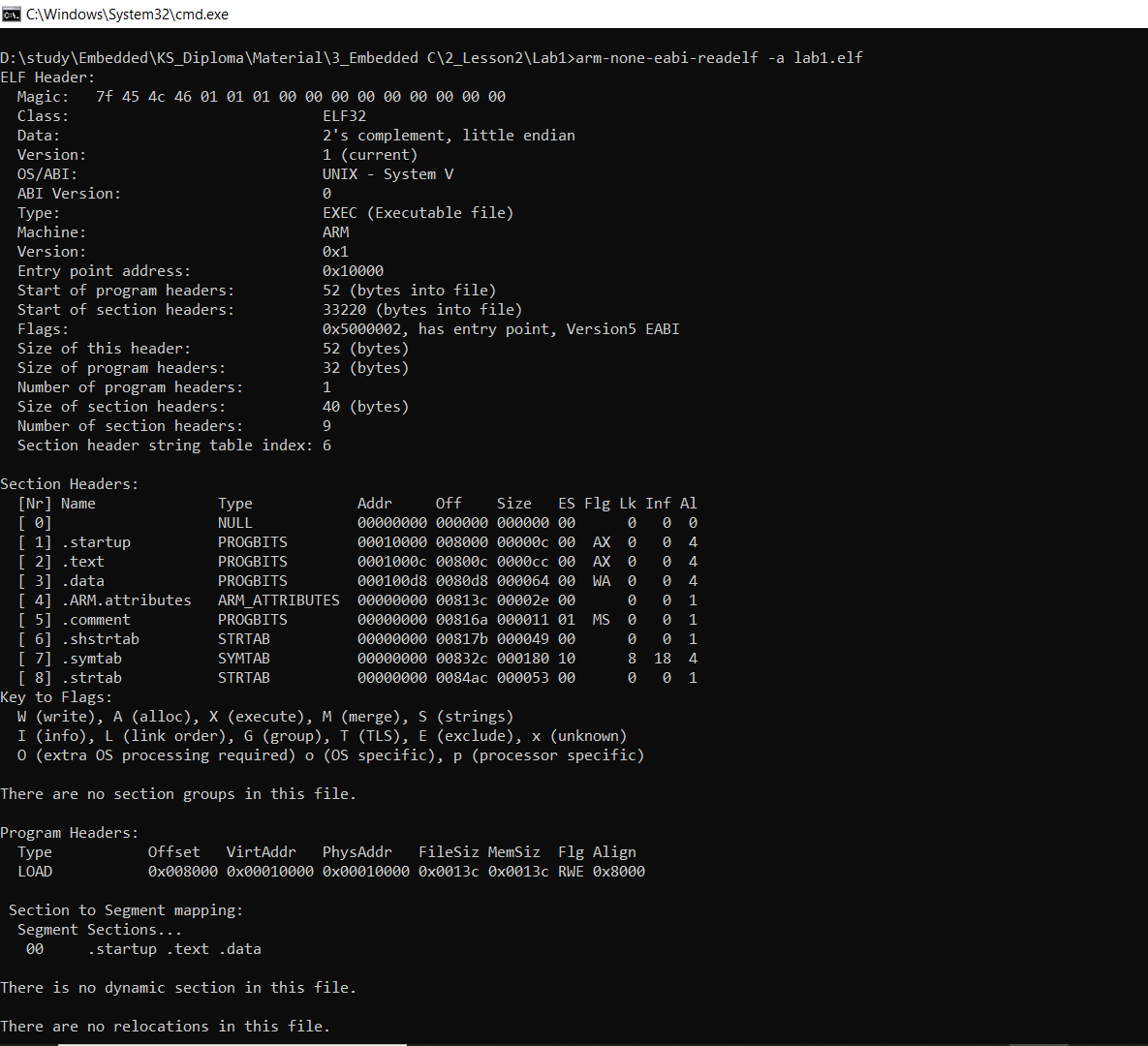
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Show assembly of .elf file:

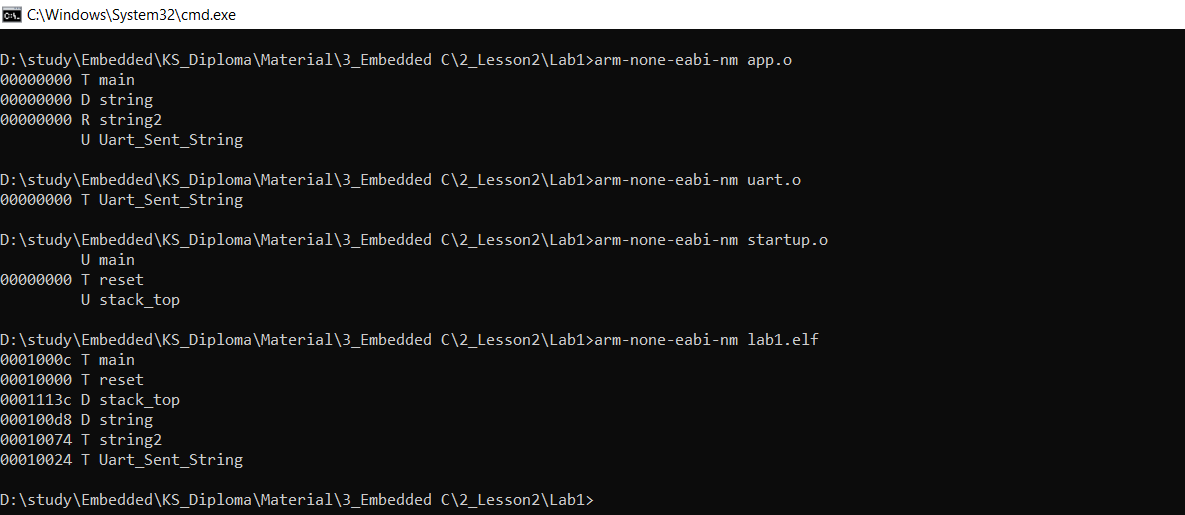
A screen shot of a computer

Description automatically generated

Show .elf information:



1. Getting the symbol table for the object files and the final elf file.



1. Getting the binary file and simulating the application using QEMU.

A computer screen with text

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1. To debug my software.

Preparing files for debugging:

A screenshot of a computer program

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Open qemu and put .elf on to simulate then open debug circuit:

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Open GDB to debug .elf file

A computer screen shot of a computer code

Description automatically generated

Connect gdb with the simulation and starting debugging:

A screenshot of a computer program

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1. Creating make file and use it .

A screenshot of a computer program

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