

Ahmedalaalotfy

QEMU run the SW

```
MINGW64/d/ahmed/Documents/Embedded systems/Mastering Embedded System/Working_Dir/Embedded_system_online_diploma/unit3_Embedded_C/unit3_lesson2/Lab_1
ahmed@DESKTOP-GN3HIS3 MINGW64 /d/ahmed/Documents/Embedded systems/Mastering Embedded System/working_Dir/Embedded_system_online_diploma/unit3_Embedded_C/unit3_lesson2/Lab_1 (
main)
$ qemu-system-arm -M versatilepb -m 128M -nographic -kernel ahmed.bin
Learn-in-depth : Ahmedalaalotfy
```

Symbol table

```
MINGW64/d/ahmed/Documents/Embedded systems/Mastering Embedded System/Working_Dir/Embedded_system_online_diploma/unit3_Embedded_C/unit3_lesson2/Lab_1
ahmed@DESKTOP-GN3HIS3 MINGW64 /d/ahmed/Documents/Embedded systems/Mastering Embedded System/working_Dir/Embedded_system_online_diploma/unit3_Embedded_C/unit3_lesson2/Lab_1 (
main)
$ arm-none-eabi-nm.exe ahmed.elf
0001000c T main
00010000 T reset
00011048 D stack_top
00010008 t stop
00010074 D string_buffer
00010024 T uart_send_string

ahmed@DESKTOP-GN3HIS3 MINGW64 /d/ahmed/Documents/Embedded systems/Mastering Embedded System/Working_Dir/Embedd
ed_system_online_diploma/unit3_Embedded_C/unit3_lesson2/Lab_1 (main)
$ |
```

Sections

```
MINGW64/d/ahmed/Documents/Embedded systems/Mastering Embedded System/Working_Dir/Embedded_system_online_diploma/unit3_Embedded_C/unit3_lesson2/Lab_1
ahmed@DESKTOP-GN3HIS3 MINGW64 /d/ahmed/Documents/Embedded systems/Mastering Embedded System/Working_Dir/Embedded_system_online_diploma/unit3_Embedded_C/unit3_lesson2/Lab_1 (
main)
$ arm-none-eabi-objdump.exe -h ahmed.elf
ahmed.elf:      file format elf32-littlearm

Sections:
Idx Name          Size      VMA           LMA         File off  Algn
 0 .startup        0000000c  00010000  00010000  00008000  2**2
   CONTENTS, ALLOC, LOAD, READONLY, CODE
 1 .text           00000068  0001000c  0001000c  0000800c  2**2
   CONTENTS, ALLOC, LOAD, READONLY, CODE
 2 .data           00000064  00010074  00010074  00008074  2**2
   CONTENTS, ALLOC, LOAD, DATA
 3 .ARM.attributes 0000002e  00000000  00000000  000080d8  2**0
   CONTENTS, READONLY
 4 .comment        00000011  00000000  00000000  00008106  2**0
   CONTENTS, READONLY

ahmed@DESKTOP-GN3HIS3 MINGW64 /d/ahmed/Documents/Embedded systems/Mastering Embedded System/Working_Dir/Embedded_system_online_diploma/unit3_Embedded_C/unit3_lesson2/Lab_1 (
main)
$ |
```

Readelf for ahmed.elf and check entry point

```
MINGW64/d/ahmed/Documents/Embedded systems/Mastering Embedded System/Working_Dir/Embedded_system_online_diploma/unit3_Embedded_C/unit3_lesson2/Lab_1
ahmed@DESKTOP-GN3HIS3 MINGW64 /d/ahmed/Documents/Embedded systems/Mastering Embedded System/Working_Dir/Embedded
ed_system_online_diploma/unit3_Embedded_C/unit3_lesson2/Lab_1 (main)
$ arm-none-eabi-readelf.exe -a ahmed.elf
ELF Header:
  Magic:   7f 45 4c 46 01 01 01 00 00 00 00 00 00 00 00 00
  Class:   ELF32
  Data:    2's complement, little endian
  Version: 1 (current)
  OS/ABI:  UNIX - System V
  ABI Version:
  Type:    EXEC (Executable file)
  Machine: ARM
  Version: 0x1
  Entry point address: 0x10000
  Start of program headers: 52 (bytes into file)
  Start of section headers: 33120 (bytes into file)
  Flags:    0x50000002, has entry point, Version5 EABI
  Size of this header: 52 (bytes)
  Size of program headers: 32 (bytes)
  Number of program headers: 1
  Size of section headers: 40 (bytes)
  Number of section headers: 9
  Section header string table index: 6

Section Headers:
 [Nr] Name              Type          Addr          Off          Size   ES Flg Lk Inf Al
 [ 0]                     NULL                00000000      000000 000000 00  0  0  0
 [ 1] .startup             PROGBITS       00010000      008000 00000c 00  AX  0  0  4
 [ 2] .text               PROGBITS       0001000c      00800c 000068 00  AX  0  0  4
 [ 3] .data               PROGBITS       00010074      008074 000064 00  WA  0  0  4
 [ 4] .ARM.attributes     ARM_ATTRIBUTES 00000000      0080d8 00002e 00  0  0  1
 [ 5] .comment            PROGBITS       00000000      008106 000011 01  MS  0  0  1
 [ 6] .shstrtab           STRTAB         00000000      008117 000049 00  0  0  1
 [ 7] .symtab             SYMTAB         00000000      0082c8 000160 10  8 17  4
 [ 8] .strtab            STRTAB         00000000      008428 000057 00  0  0  1

Key to Flags:
 W (write), A (alloc), X (execute), M (merge), S (strings)
 I (info), L (link order), G (group), T (TLS), E (exclude), x (unknown)
 O (extra OS processing required) o (OS specific), p (processor specific)

There are no section groups in this file.

Program Headers:
 Type      Offset      VirtAddr      PhysAddr     FileSiz MemSiz  Flg Align
 LOAD      0x008000  0x00010000    0x00010000   0x000d8 0x000d8  RWE 0x8000

Section to Segment mapping:
Segment Sections...
 00       .startup .text .data

There is no dynamic section in this file.
```

Map file

```
D:\ahmed\Documents\Embedded systems\Mastering Embedded System\Working_Dir\Embedded_system_online_diploma\unit3_Embedded_C\unit3_lesson2\Lab_1\output.map - Notepad++
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
change.log TMR_program.c TMR_config.h DCM_program.c SERVOM_program.c main.c ATMEGA32_REG.h SSD_program.c DIO_program.c ADC_interface.h linker_script.ld output.map
1
2 Memory Configuration
3
4 Name Origin Length Attributes
5 Mem 0x00000000 0x04000000 xrw
6 *default* 0x00000000 0xffffffff
7
8 Linker script and memory map
9
10 0x00010000 . = 0x10000
11
12 .startup 0x00010000 0xc
13 startup.o(.text)
14 .text 0x00010000 0xc startup.o
15 reset
16
17 .text 0x0001000c 0x68
18 *(.text)
19 .text 0x0001000c 0x18 app.o
20 main
21 .text 0x00010024 0x50 uart.o
22 Uart_send_string
23 *(.rodata)
24
25 .glue_7 0x00010074 0x0
26 .glue_7 0x00000000 0x0 linker stubs
27
28 .glue_7t 0x00010074 0x0
29 .glue_7t 0x00000000 0x0 linker stubs
30
31 .vfp11_veneer 0x00010074 0x0
32 .vfp11_veneer 0x00000000 0x0 linker stubs
33
34 .v4_bx 0x00010074 0x0
35 .v4_bx 0x00000000 0x0 linker stubs
Normal text file length: 2,445 lines: 79 Ln: 1 Col: 1 Pos: 1 Windows (CR LF) UTF-8 INS
```

```
D:\ahmed\Documents\Embedded systems\Mastering Embedded System\Working_Dir\Embedded_system_online_diploma\unit3_Embedded_C\unit3_lesson2\Lab_1\output.map - Notepad++
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
change.log TMR_program.c TMR_config.h DCM_program.c SERVOM_program.c main.c ATMEGA32_REG.h SSD_program.c DIO_program.c ADC_interface.h linker_script.ld output.map
34 .v4_bx 0x00010074 0x0
35 .v4_bx 0x00000000 0x0 linker stubs
36
37 .iplt 0x00010074 0x0
38 .iplt 0x00000000 0x0 startup.o
39
40 .rel.dyn 0x00010074 0x0
41 .rel.iplt 0x00000000 0x0 startup.o
42
43 .data 0x00010074 0x64
44 *(.data)
45 .data 0x00010074 0x0 startup.o
46 .data 0x00010074 0x64 app.o
47 string_buffer
48 .data 0x000100d8 0x0 uart.o
49
50 .igot.plt 0x000100d8 0x0
51 .igot.plt 0x00000000 0x0 startup.o
52
53 .bss 0x000100d8 0x0
54 *(.bss)
55 .bss 0x000100d8 0x0 startup.o
56 .bss 0x000100d8 0x0 app.o
57 .bss 0x000100d8 0x0 uart.o
58 *(COMMON)
59 0x000110d8 . = (. + 0x1000)
60 0x000110d8 stack_top = .
61 LOAD app.o
62 LOAD uart.o
63 LOAD startup.o
64 OUTPUT(ahmed.elf elf32-littlearm)
65
66 .ARM.attributes
67 0x00000000 0x2e
68 .ARM.attributes
Normal text file length: 2,445 lines: 79 Ln: 1 Col: 1 Pos: 1 Windows (CR LF) UTF-8 INS
```