# Unit3 – Lab1

## Sections of each object & size of each section:

Startup.o:

```
rafik@DESKTOP-ARVTQ7Q MINGW64 /d/Embedded Course/Unit3_Embedded_C/L2_Lab1
$ arm-none-eabi-objdump.exe -h startup.o

startup.o:     file format elf32-littlearm

Sections:
Idx Name          Size      VMA       LMA       File off  Algn
  0 .text         00000010  00000000  00000000  00000034  2**2
                  CONTENTS, ALLOC, LOAD, RELOC, READONLY, CODE
  1 .data         00000000  00000000  00000000  00000044  2**0
                  CONTENTS, ALLOC, LOAD, DATA
  2 .bss          00000000  00000000  00000000  00000044  2**0
                  ALLOC
  3 .ARM.attributes 00000022  00000000  00000000  00000044  2**0
                  CONTENTS, READONLY
```

App.o:

```
rafik@DESKTOP-ARVTQ7Q MINGW64 /d/Embedded Course/Unit3_Embedded_C/L2_Lab1
$ arm-none-eabi-objdump.exe -h app.o

app.o:     file format elf32-littlearm

Sections:
Idx Name          Size      VMA       LMA       File off  Algn
  0 .text         0000001c  00000000  00000000  00000034  2**2
                  CONTENTS, ALLOC, LOAD, RELOC, READONLY, CODE
  1 .data         00000064  00000000  00000000  00000050  2**2
                  CONTENTS, ALLOC, LOAD, DATA
  2 .bss          00000000  00000000  00000000  000000b4  2**0
                  ALLOC
  3 .rodata       00000064  00000000  00000000  000000b4  2**2
                  CONTENTS, ALLOC, LOAD, READONLY, DATA
  4 .comment      0000004a  00000000  00000000  00000118  2**0
                  CONTENTS, READONLY
  5 .ARM.attributes 0000002c  00000000  00000000  00000162  2**0
                  CONTENTS, READONLY
```

Uart.o:

```
rafik@DESKTOP-ARVTQ7Q MINGW64 /d/Embedded Course/Unit3_Embedded_C/L2_Lab1
$ arm-none-eabi-objdump.exe -h uart.o

uart.o:     file format elf32-littlearm

Sections:
Idx Name          Size      VMA       LMA       File off  Algn
  0 .text         00000058  00000000  00000000  00000034  2**2
                  CONTENTS, ALLOC, LOAD, READONLY, CODE
  1 .data         00000000  00000000  00000000  0000008c  2**0
                  CONTENTS, ALLOC, LOAD, DATA
  2 .bss          00000000  00000000  00000000  0000008c  2**0
                  ALLOC
  3 .comment      0000004a  00000000  00000000  0000008c  2**0
                  CONTENTS, READONLY
  4 .ARM.attributes 0000002c  00000000  00000000  000000d6  2**0
                  CONTENTS, READONLY
```

## Symbols & What was unresolved in each section:

Startup.o:

```
rafik@DESKTOP-ARVTQ7Q MINGW64 /d/Embedded Course/Unit3_Embedded_C/L2_Lab1
$ arm-none-eabi-nm.exe startup.o
         U main
00000000 T reset
         U stack_top
00000008 t stop
```

App.o:

```
rafik@DESKTOP-ARVTQ7Q MINGW64 /d/Embedded Course/Unit3_Embedded_C/L2_Lab1
$ arm-none-eabi-nm.exe app.o
00000000 T main
00000000 D string_buffer
00000000 R string_buffer2
         U Uart_Send_String
```

Uart.o:

```
rafik@DESKTOP-ARVTQ7Q MINGW64 /d/Embedded Course/Unit3_Embedded_C/L2_Lab1
$  arm-none-eabi-nm.exe uart.o
00000000 T Uart_Send_String
```

## Entry point:

```
rafik@DESKTOP-ARVTQ7Q MINGW64 /d/Embedded Course/Unit3_Embedded_C/L2_Lab1
$ arm-none-eabi-readelf.exe -a learn-in-depth.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:                       0
  Type:                              EXEC (Executable file)
  Machine:                           ARM
  Version:                           0x1
  Entry point address:               0x10000
  Start of program headers:          52 (bytes into file)
  Start of section headers:          66548 (bytes into file)
  Flags:                             0x5000200, Version5 EABI, soft-float ABI
  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: 8

Section Headers:
  [Nr] Name              Type            Addr     Off    Size   ES Flg Lk Inf Al
  [ 0]                   NULL            00000000 000000 000000 00      0   0  0
  [ 1] .reset            PROGBITS        00010000 010000 000010 00  AX  0   0  4
  [ 2] .text             PROGBITS        00010010 010010 0000d8 00  AX  0   0  4
  [ 3] .data             PROGBITS        000100e8 0100e8 000064 00  WA  0   0  4
  [ 4] .ARM.attributes   ARM_ATTRIBUTES  00000000 01014c 00002e 00      0   0  1
  [ 5] .comment          PROGBITS        00000000 01017a 000049 01  MS  0   0  1
  [ 6] .symtab           SYMTAB          00000000 0101c4 000180 10      7  18  4
  [ 7] .strtab           STRTAB          00000000 010344 000066 00      0   0  1
  [ 8] .shstrtab         STRTAB          00000000 0103aa 000047 00      0   0  1
Key to Flags:
```

Section addresses after executable file:

```
rafik@DESKTOP-ARVTQ7Q MINGW64 /d/Embedded Course/Unit3_Embedded_C/L2_Lab1
$  arm-none-eabi-objdump.exe -h learn-in-depth.elf

learn-in-depth.elf:     file format elf32-littlearm

Sections:
Idx Name          Size      VMA       LMA       File off  Algn
  0 .reset        00000010  00010000  00010000  00010000  2**2
                  CONTENTS, ALLOC, LOAD, READONLY, CODE
  1 .text         000000d8  00010010  00010010  00010010  2**2
                  CONTENTS, ALLOC, LOAD, READONLY, CODE
  2 .data         00000064  000100e8  000100e8  000100e8  2**2
                  CONTENTS, ALLOC, LOAD, DATA
  3 .ARM.attributes 0000002e  00000000  00000000  0001014c  2**0
                  CONTENTS, READONLY
  4 .comment      00000049  00000000  00000000  0001017a  2**0
                  CONTENTS, READONLY
```

Symbol table of executable file:

```
rafik@DESKTOP-ARVTQ7Q MINGW64 /d/Embedded Course/Unit3_Embedded_C/L2_Lab1
$ arm-none-eabi-nm.exe learn-in-depth.elf
00010010 T main
00010000 T reset
0001114c D stack_top
00010008 t stop
000100e8 D string_buffer
00010084 T string_buffer2
0001002c T Uart_Send_String
```