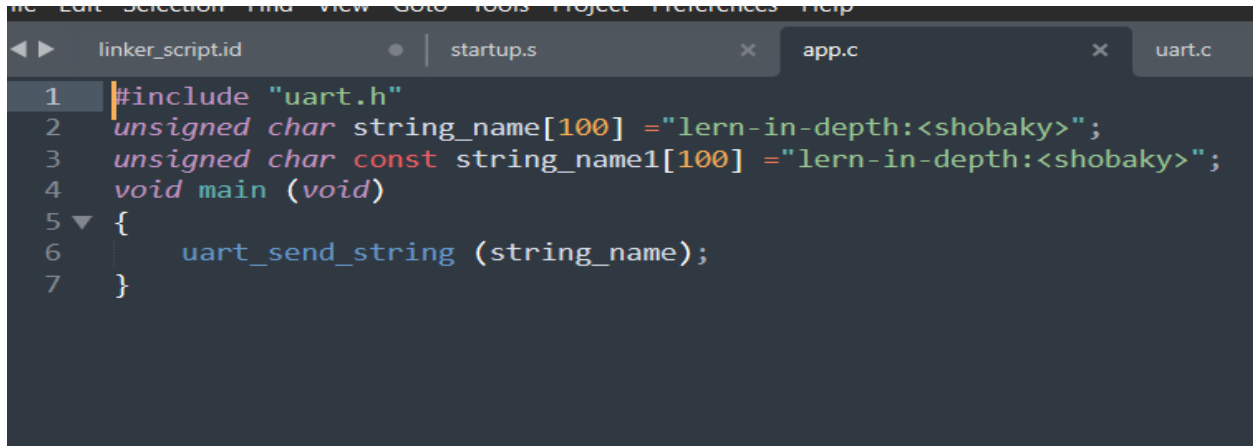


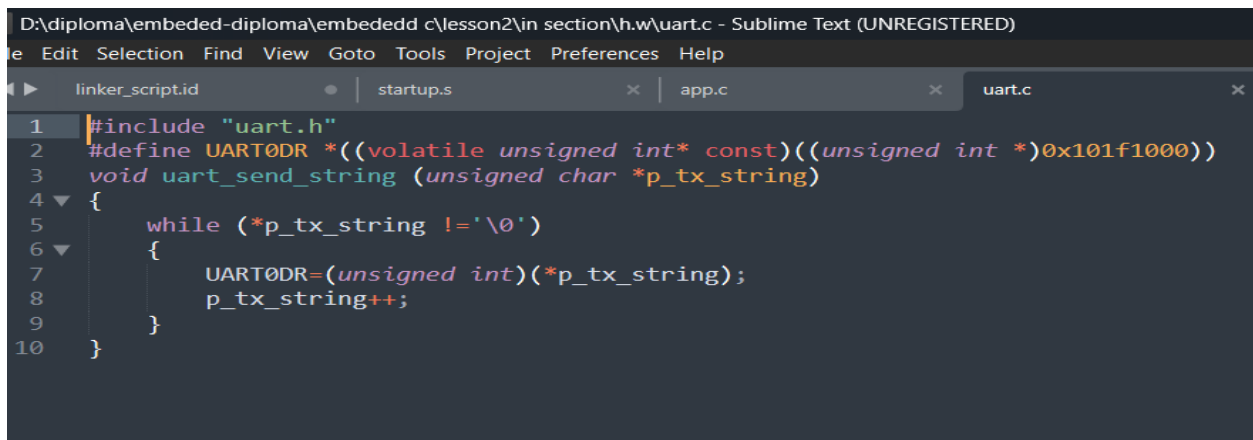
# Report on lab1

## 1-App.c



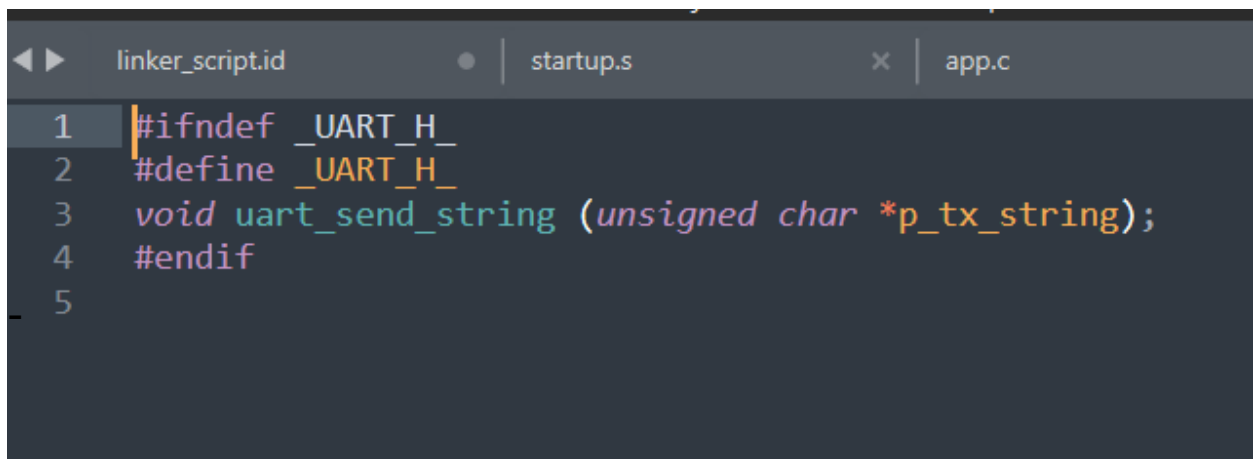
```
1 #include "uart.h"
2 unsigned char string_name[100] = "lern-in-depth:<shobaky>";
3 unsigned char const string_name1[100] = "lern-in-depth:<shobaky>";
4 void main (void)
5 {
6     uart_send_string (string_name);
7 }
```

## 2-uart.c



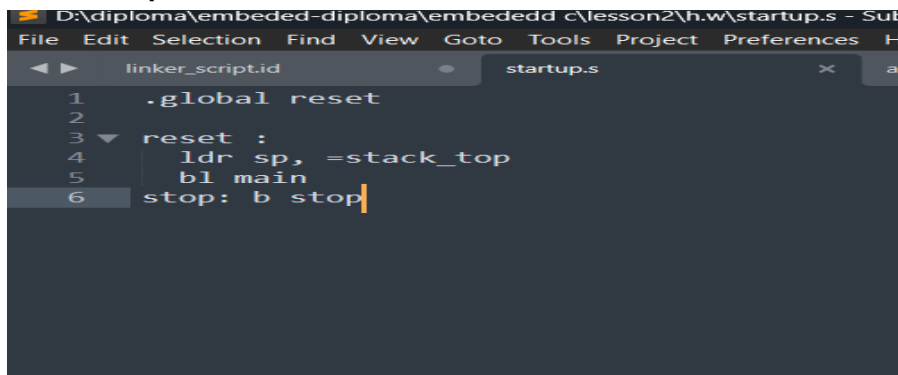
```
D:\diploma\embeded-diploma\embededd c\lesson2\in section\h.w\uart.c - Sublime Text (UNREGISTERED)
1 #include "uart.h"
2 #define UART0DR *((volatile unsigned int* const)((unsigned int *)0x101f1000))
3 void uart_send_string (unsigned char *p_tx_string)
4 {
5     while (*p_tx_string != '\0')
6     {
7         UART0DR=(unsigned int)(*p_tx_string);
8         p_tx_string++;
9     }
10 }
```

## 3-uart.o



```
1 #ifndef _UART_H_
2 #define _UART_H_
3 void uart_send_string (unsigned char *p_tx_string);
4 #endif
5
```

## 4-startup.s



```
D:\diploma\embeded-diploma\embededd c\lesson2\h.w\startup.s - Sub
File Edit Selection Find View Goto Tools Project Preferences H
linker_script.id startup.s
1 .global reset
2
3 reset :
4     ldr sp, =stack_top
5     bl main
6 stop: b stop
```

## 5-linker\_script



```
linker_script.id startup.s app.c
7
8 SECTIONS
9 {
10     . = 0x10000;
11     .startup . :
12     {
13         startup.o(.text)
14     }> Mem
15
16     .text :
17     {
18         *(.text) *(.rodata)
19     }> Mem
20
21     .data :
22     {
23         *(.data)
24     }> Mem
25
26     .bss :
27     {
28         *(.bss) *(.comment)
29     }> Mem
30
31     . = . + 0x1000;
32     stack_top = .;
33
34 }
```

## Section on app.o, uart.o, startup.o

```
Mohamed Alshopaky@LAPTOP-9D8HPTS8 MINGW32 /d/diploma/embedded-diploma/embeddedd c/  
lesson2/in section/h.w (main)
```

```
$ 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	00000024	00000000	00000000	00000034	2**2
	CONTENTS, ALLOC, LOAD, RELOC, READONLY, CODE					
1	.data	00000064	00000000	00000000	00000058	2**2
	CONTENTS, ALLOC, LOAD, DATA					
2	.bss	00000000	00000000	00000000	000000bc	2**0
	ALLOC					
3	.rodata	00000064	00000000	00000000	000000bc	2**2
	CONTENTS, ALLOC, LOAD, READONLY, DATA					
4	.comment	0000007f	00000000	00000000	00000120	2**0
	CONTENTS, READONLY					
5	.ARM.attributes	00000030	00000000	00000000	0000019f	2**0
	CONTENTS, READONLY					

```
Mohamed Alshopaky@LAPTOP-9D8HPTS8 MINGW32 /d/diploma/embedded-diploma/embeddedd c/  
lesson2/in section/h.w (main)
```

```
$ 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	00000054	00000000	00000000	00000034	2**2
	CONTENTS, ALLOC, LOAD, RELOC, READONLY, CODE					
1	.data	00000000	00000000	00000000	00000088	2**0
	CONTENTS, ALLOC, LOAD, DATA					
2	.bss	00000000	00000000	00000000	00000088	2**0
	ALLOC					
3	.comment	0000007f	00000000	00000000	00000088	2**0
	CONTENTS, READONLY					
4	.ARM.attributes	00000030	00000000	00000000	00000107	2**0
	CONTENTS, READONLY					

```
Mohamed Alshopaky@LAPTOP-9D8HPTS8 MINGW32 /d/diploma/embedded-diploma/embeddedd c/  
lesson2/in section/h.w (main)
```

```
$ 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	00000012	00000000	00000000	00000044	2**0
	CONTENTS, READONLY					

## -Symbols app.o uart.o

```
Mohamed Alshopaky@LAPTOP-9D8HPTS8 MINGW32 /d/diploma/embedded-diploma/embeddedd c/
lesson2/in section/h.w (main)
$ arm-none-eabi-nm.exe app.o
00000000 T main
00000000 D string_name
00000000 R string_name2
          U uart_send_string

Mohamed Alshopaky@LAPTOP-9D8HPTS8 MINGW32 /d/diploma/embedded-diploma/embeddedd c/
lesson2/in section/h.w (main)
$ arm-none-eabi-nm.exe uart.o
00000000 T uart_send_string
```

## To show sections for App.elf

```
Mohamed Alshopaky@LAPTOP-9D8HPTS8 MINGW32 /d/diploma/embedded-diploma/embeddedd c/
lesson2/in section/h.w (main)
$ arm-none-eabi-objdump.exe -h lern-in-depth.elf

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

Sections:
Idx Name              Size      VMA           LMA           File off  Algn
  0 .startup            00000010  00010000  00010000  00010000  2**2
    CONTENTS, ALLOC, LOAD, READONLY, CODE
  1 .fess               000000dc  00010010  00010010  00010010  2**2
    CONTENTS, ALLOC, LOAD, READONLY, CODE
  2 .data               00000064  000100ec  000100ec  000100ec  2**2
    CONTENTS, ALLOC, LOAD, DATA
  3 .bss                0000007e  00010150  00010150  00010150  2**0
    CONTENTS, ALLOC, LOAD, DATA
  4 .ARM.attributes     0000002c  00000000  00000000  000101ce  2**0
    CONTENTS, READONLY
```

## To show symbol table for App.elf

```
Mohamed Alshopaky@LAPTOP-9D8HPTS8 MINGW32 /d/diploma/embedded-diploma/embeddedd c/
lesson2/in section/h.w (main)
$ arm-none-eabi-nm.exe lern-in-depth.elf
00010010 T main
00010000 T reset
000111ce B stack_top
00010008 t stop
000100ec D string_name
00010088 T string_name2
00010034 T uart_send_string
```

## burn binary file on board using qemu

```
MINGW32:/d/diploma/embeded-diploma/embededd c/lesson2/in section/h.w
Mohamed Alshopaky@LAPTOP-9D8HPTS8 MINGW32 /d/diploma/embeded-diploma/embededd c/
lesson2/in section/h.w (main)
$ ../qemu/qemu-system-arm -M versatilepb -m 128M -nographic -kernel lern-in-dept
h.bin
lern-in-depth: <shobaky>
```