



Faculty of Engineering
Ain Shams University
CSE 211s:Introduction to Embedded Systems
REPORT (1)

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Sec.: 1

Program: CSE

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Code in C:

```
int j=0;
int i;
for ( i = 0 ; i < 15 ; i++){

    j = j + i;

}
```

Code explanation:

This code stores the updated value of j by adding the value of i till i = 14. Once i = 15 the iteration stops and the loop breaks.

After compilation of the program:

i = 15 → 0x0000 000F

j = 105 → 0x0000 0069

address of j in memory → 0x2000 0004

Assembly Code:

AREA RESET, DATA, READONLY

EXPORT __Vectors

__Vectors

DCD 0x20008000

DCD Reset_Handler

ALIGN

AREA myCode, CODE, ReadOnly

ENTRY

EXPORT Reset_Handler

Reset_Handler

LDR R0, =0x20000004

MOV R1, #0 ; j = 0

MOV R2, #0 ; i = 0

Loop CMP R2, #15 ; compare between i and 15

BGE EndLoop

ADD R1, R1, R2 ; j = j + i

ADD R2, #1 ; i++

B Loop


EndLoop STR R1, [R0] ;store the value of j in the memory

END

Registers:

| Registers | |
|-----------|------------|
| Register | Value |
| Core | |
| R0 | 0x20000004 |
| R1 | 0x00000069 |
| R2 | 0x0000000F |
| R3 | 0x00000000 |
| R4 | 0x00000000 |
| R5 | 0x00000000 |
| R6 | 0x00000000 |
| R7 | 0x00000000 |
| R8 | 0x00000000 |
| R9 | 0x00000000 |
| R10 | 0x00000000 |
| R11 | 0x00000000 |
| R12 | 0x00000000 |
| R13 (SP) | 0x20008000 |
| R14 (LR) | 0xFFFFFFFF |
| R15 (PC) | 0x00000020 |
| + xPSR | 0x61000000 |

Memory:

| Memory 1 | |
|------------------------------|---|
| Address: 0x20000004 |  |
| 0x20000004: | 69 00 |
| 0x2000001B: | 00 |
| 0x20000032: | 00 |
| 0x20000049: | 00 |
| 0x20000060: | 00 |
| Call Stack + Locals Memory 1 | |