COMPUTER ORGANIZATION AND MICROPROCESSOR

ENCS2380

Assembly Assignment

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Section: 1

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CODE:

```
 AREA RESET, DATA, READONLY


    EXPORT __Vectors

__Vectors DCD 0x20001000

              DCD Reset_Handler

             ALIGN


ARRAY DCB 34, 56, 27, 156, 200, 68, 128,235, 17, 45



      AREA MYRAM, DATA, READWRITE

;intializing these two in the memory of size 32 bit
SUM  DCD 0
EVEN DCD 0

LP2_ARRAY DCB 1,1,1,1,1,1,1,1,1,1 ; LARGEST POWER ARRAY OF 2, INITIALLY ONE
THIS WILL CHANGE RELYING ON CORROSPONDING INDEX IN THE ORIGINAL ARRAY

      AREA MYCODE, CODE, READONLY

       ENTRY

       EXPORT Reset_Handler

;IMPLEMENTING THE POW2 PROC



POW2 PROC

LOOP3
          TST R3, #1 ; THIS METHOD IS USED TO CHECK IF THE NUMBER IS EVEN OR
ODD, BY MAKING 'TST' (AND WITHOUT CHANGING THE ORIGINAL VALUE, IF IT GIVES
ZERO THEN IT'S ODD OTHERWISE EVEN
          LSREQ R3, #1 ;LOGICAL SHIFT RIGHT (DIVIDING BY 2)
          LSLEQ R4, #1;LOGICAL SHIFT LEFT (MULTIPLYING BY 2)
          BEQ LOOP3 ; IF Z FLAG 1 BRANCH
          STRB R4, [R1] ; STORES THE VALUE IN MEMORY
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        BX LR ; BX : branch and exchange instruction set, LR : HOLDS THE RETURN
ADDRESS
        ENDP  ; END OF PROCEDURE


Reset_Handler



;;;;;;;;your assembly code here

;
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        ;; QUESTION A & B
        LDR R1, =ARRAY ; GETS THE ADDRESS OF THE FIRST ELEMENT IN THE
ARRAY

        MOV R4, #10 ; 10 NUMBER OF ELEMENTS IN THE ARRAY


LOOP

        LDRB R2, [R1]           ;           GETTS THE VALUE OF INDEX R1 AND STORES IT
IN R2  B: BYTE
        ADD R1, R1, #1 ; INCREMENTING R1

        ADD R3, R3, R2 ; R3 PRESENTS THE LOCAL SUM

        SUBS R4, R4 , #1 ;DECREMENT R4 SO WHEN IT'S ZERO WE END  ,S FOR FLAG


        BNE LOOP ; NOT EQUAL ZERO

        LDR R5 , =SUM ; GETS THE ADDRESS OF SUM AND STORES IT IN R5

        STR R3, [R5] ; STORES LOCAL SUM (R3) INTO GLOBAL SUM WHICH ITS
ADDRESS IN R5

        ;
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        ; QUESTION C ::


        LDR R1, =ARRAY
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```
        MOV R4, #10
        LDR R6, =EVEN ; STORES ADDRESS OF 'EVEN' INTO THE REGISTER R6


LOOP2

        LDRB R2, [R1]          ;          GETTS THE VALUE OF INDEX R1 AND STORES IT
IN R2  B: BYTE
        TST R2 , #1            ; FOR CHECKING IF EVEN  ... (EXPLAINED MORE ABOVE)
        ADDEQ R7,R7,R2     ; EVENSUM  STORED IN R7
        ADD R1, R1, #1 ; ITERATE
        SUBS R4, R4 , #1 ;DECREMENT S FOR FLAG
        BNE LOOP2 ; NOT EQUAL ZERO

        STR R7, [R6] ; STORES INTO MEMORY



;
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; QUESTION  : D

        ;BIT CLEAR THESE REGISTERS
        BIC R1, #0xFFFFFFFF
        BIC R2, #0xFFFFFFFF
        BIC R3, #0xFFFFFFFF
        BIC R4, #0xFFFFFFFF
        BIC R0, #0xFFFFFFFF
        BIC R5, #0xFFFFFFFF



        LDR R0, =ARRAY
        LDR R1, =LP2_ARRAY ; GETS THE ADDRESS OF FIRST ELEMENT IN THE
ARRAY

        MOV R2, #10 ; SIZE OF ARRAY AND = NUMBER OF ITERATIONS

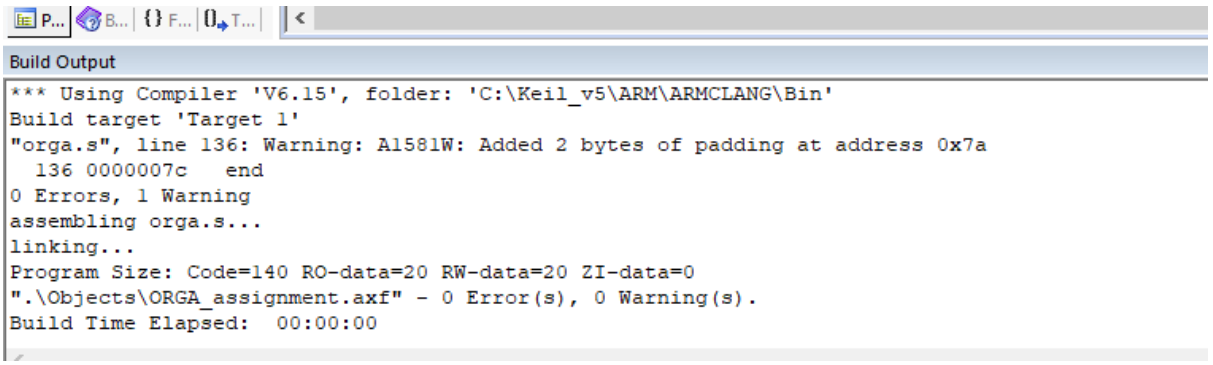
; ITERATING OVER ALL ELEMENTS IN THE ARRAY
LOOP4
        LDRB R3, [R0] ; GETS THE VALUE IN INDEX R0 IN THE ARRAY
        MOV R4 , #1 ; USED AS FOR PARAMETR STUFF FOR POW2
        BL POW2
        ADD R0,R0,#1
        ADD R1,R1,#1
```

```
        SUBS R2,R2,#1
        BNE LOOP4

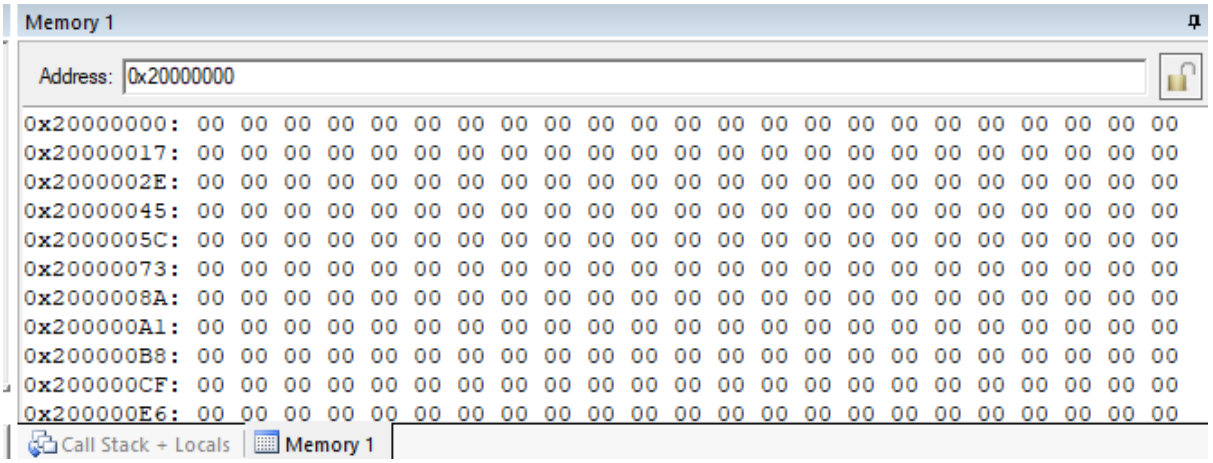

Stop  B Stop

                end
```

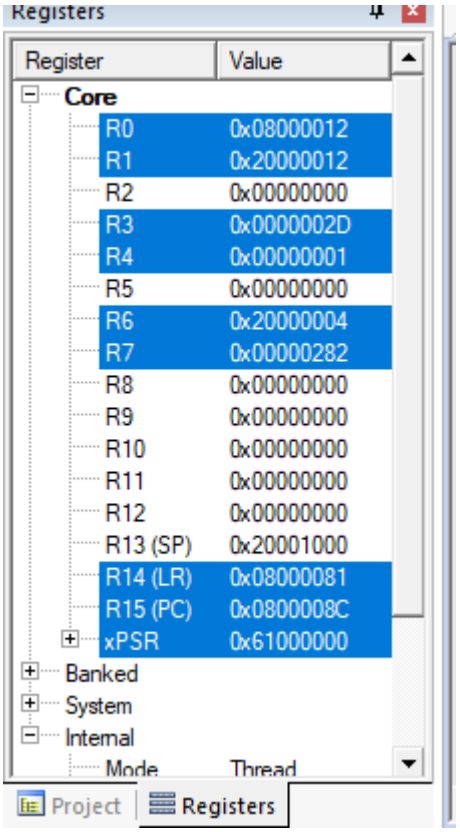
SNAP SHOTS:

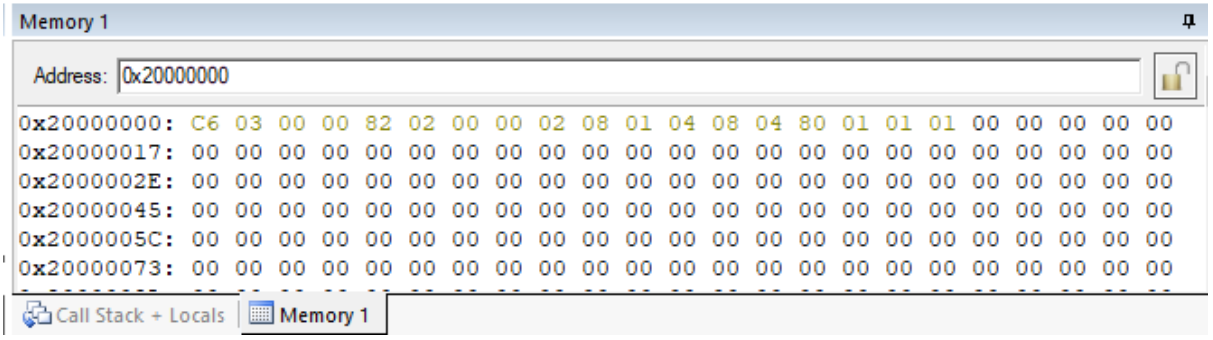


Initially :



After execution:





P.S: including every needed thing, SUM(0X20000000), EVENSUM(0X20000004), ARRAY OF POWER2 FIRST INDEX : (0X20000008)