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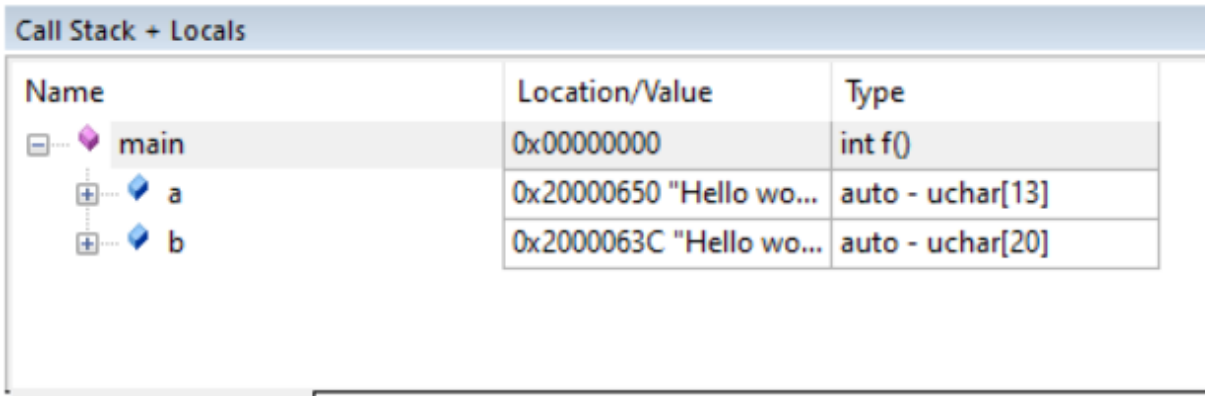
Digitial systems lab - 6

Task1

- output of the simulation is presented here
  - 

Task2

```
#include<stdio.h>
#include<stdlib.h>
#include<string.h>
#include "stm32f4xx.h"

__asm void your_strcpy(const char *src, char *dst){

loop
    LDRB r2, [r0], #1
    STRB r2, [r1], #1
    CMP r2, #0
    BNE loop
    BX lr
}

__asm void your_capitalise(const char *src, char *dst){

loopmain
    LDRB r2, [r0], #1
    CMP r2,#97
    blt asitis
    CMP R2,#122
    BGT asitis
    SUB r2,r2,#32
    STRB r2, [r1], #1
    CMP r2, #0
    BNE loopmain
    BX lr

asitis
```

```
    STRB r2, [r1], #1
    CMP r2, #0
    BNE loopmain
    BX LR
}


__asm void your_reverse(const char *src, char *dst){

main
    mov r6,r0
    mov r7,lr
    push {r0,LR}
    BL getlen
    POP {R0,LR}
    sub r4,r4,#1
    add r0,r0,r4

reverse
    LDRB r2,[r0],#-1
    sub r4,r4,#1
    strb r2,[r1],#1
    cmp r4,#-1
    beq endrev
    b reverse

endrev
    mov r2,#0x0
    strb r2,[r1]
    bx LR

getlen
    LDRB r2,[r0],#1
    CMP r2,#0
    BNE contgetlen
    BX LR

contgetlen
    ADD R4,R4,#1
    B getlen
}



int main(void){
    //const char a[] = "hEllo WorlD";
    //const char a[] = "DIgiTal SyStem";
    const char a[] = "DIzital#$@-SySx";
    char b[20];
    char c[20];
    //your_strcpy(a, b);
    your_capitalise(a,b);
    your_reverse(a,c);
    while (1);
```

```
    return 0;
}
```

Please Note that output of 1st question is stored in **b** and output of 2nd question is stored in **c**

Testing on Multiple inputs

- Call Stack + Locals

Name	Location/Value	Type
main	0x00000000	int f()
a	0x20000654 "hEllo WorlD"	auto - uchar[12]
b	0x20000640 "HELLO WORLD"	auto - uchar[20]
c	0x2000062C "DlroW ollEh"	auto - uchar[20]

- Call Stack + Locals

Name	Location/Value	Type
main	0x00000000	int f()
a	0x20000650 "DlgiTal SyStem"	auto - uchar[15]
b	0x2000063C "DIGITAL SYSTEM"	auto - uchar[20]
c	0x20000628 "metSyS laTigID"	auto - uchar[20]

- Call Stack + Locals

Name	Location/Value	Type
main	0x00000000	int f()
a	0x20000650 "Dlzital#$@-SySx"	auto - uchar[16]
b	0x2000063C "DIZITAL#$@-SYSX"	auto - uchar[20]
c	0x20000628 "xSyS-@$#latizlD"	auto - uchar[20]

logic for que-1:

- first store the value of a char in r2 and then check if its ascii value is less than 97 (ascii of a) and greater than 122 (ascii of z) if it stisfies the above condition then leave it as it is since it is not a small alphabet but if its ascii value lies between 97 and 122 then make it capital

logic for que-2:

- first get the length of the string to be reversed
- then iterate over the string in reverse manner and store each byte in destination address and at last add 0x0 to end the string