

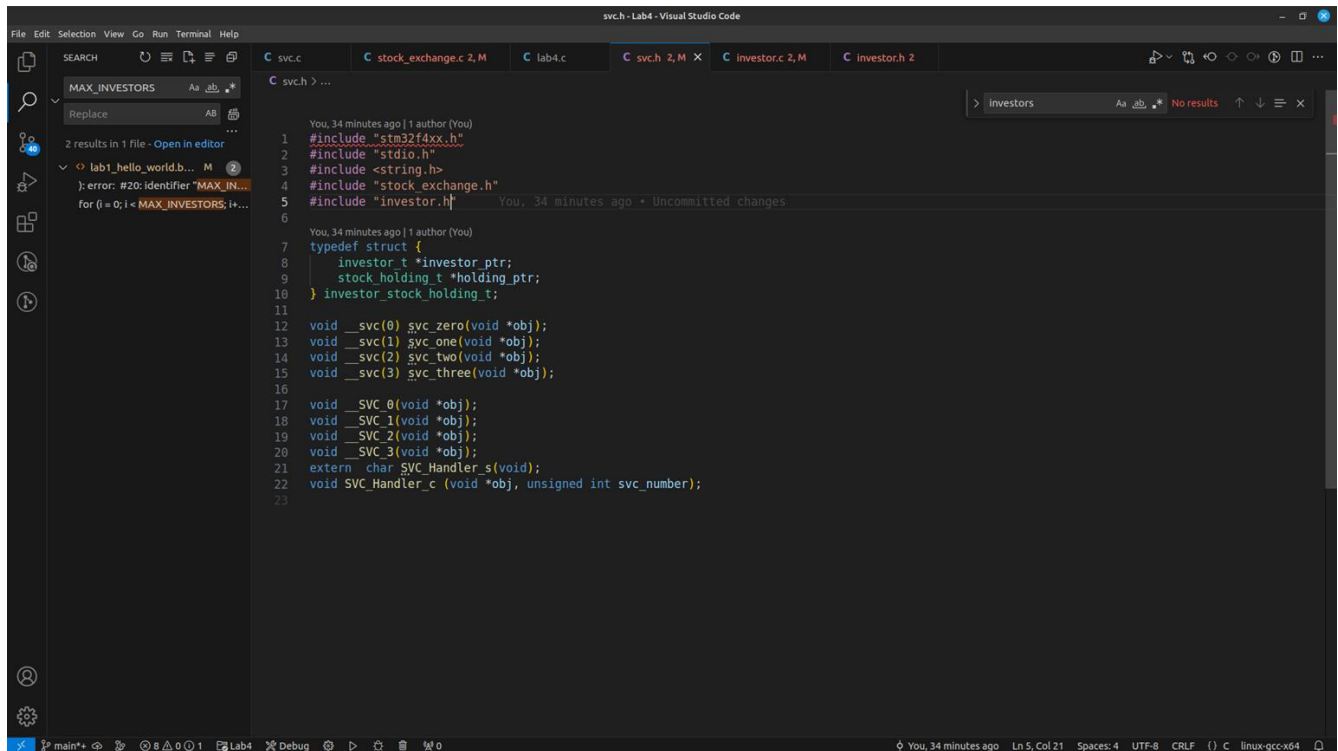
CEG3136 Lab 4 Report

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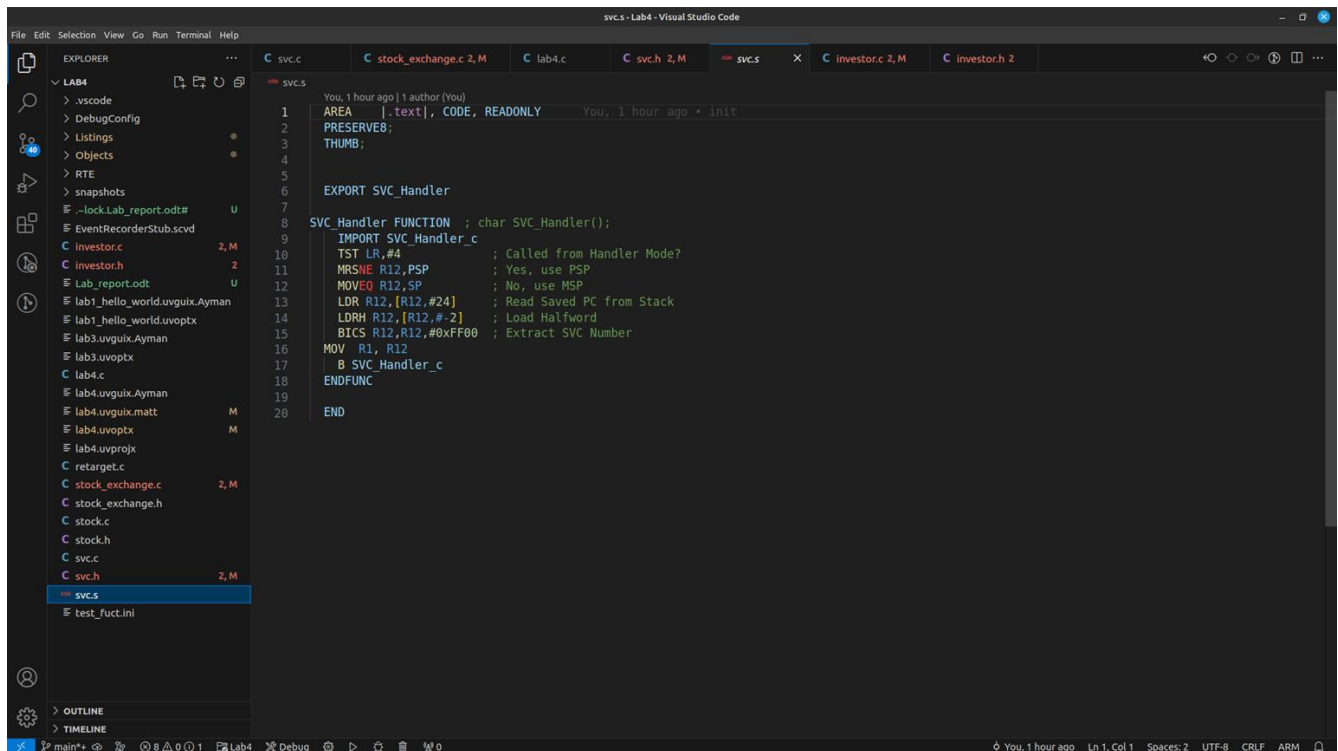
1. Code Snips

svc.h:



```
1  You, 34 minutes ago | 1 author (You)
2  #include "stm32f4xx.h"
3  #include "stdio.h"
4  #include <string.h>
5  #include "stock_exchange.h"
6  #include "investor.h"
7
8  typedef struct {
9      investor_t *investor_ptr;
10     stock_holding_t *holding_ptr;
11 } investor_stock_holding_t;
12
13 void __svc(0) __svc_zero(void *obj);
14 void __svc(1) __svc_one(void *obj);
15 void __svc(2) __svc_two(void *obj);
16 void __svc(3) __svc_three(void *obj);
17
18 void __SVC_0(void *obj);
19 void __SVC_1(void *obj);
20 void __SVC_2(void *obj);
21 void __SVC_3(void *obj);
22 extern char SVC_Handler_s(void);
23 void SVC_Handler_c(void *obj, unsigned int svc_number);
```

SVC.S:



```
1  You, 1 hour ago | 1 author (You)
2  AREA |.text|, CODE, READONLY
3  PRESERVE8;
4  THUMB;
5
6  EXPORT SVC_Handler
7
8  SVC_Handler FUNCTION ; char SVC_Handler();
9      IMPORT SVC_Handler_c
10     TST LR, #4 ; Called from Handler Mode?
11     MRSNE R12, PSP ; Yes, use PSP
12     MOVED R12, SP ; No, use MSP
13     LDR R12, [R12, #24] ; Read Saved PC from Stack
14     LDRH R12, [R12, #-2] ; Load Halfword
15     BICS R12, R12, #0xFF00 ; Extract SVC Number
16     MOV R1, R12
17     B SVC_Handler_c
18 ENDFUNC
19
20 END
```

SVC.C:

```
1  #include "svc.h"
2
3
4  void SVC_Handler_c (void *obj, unsigned int svc_number) {           // SVC Interrupt Handler
5      //printf("svc_number = %d\n", svc_number);                     // Increment Counter
6      switch (svc_number) {
7          case 0: __SVC_0(obj); break;
8          case 1: __SVC_1(obj); break;
9          case 2: __SVC_2(obj); break;
10         case 3: __SVC_3(obj); break;
11     }
12 }
13
14
15 void __SVC_0( void *obj){
16     char *str = (char*) obj;
17     printf("svc_zero: %s\n", str);
18 }
19
20 void __SVC_1( void *obj){
21     char *str = (char*) obj;
22     printf("svc_one: %s\n", str);
23 }
24
25 void __SVC_2(void *obj) { // calls investor_buy
26     investor_stock_holding_t *investor_stock = (investor_stock_holding_t *)obj;
27     investor_buy(investor_stock->investor_ptr, investor_stock->holding_ptr);
28 }
29
30 void __SVC_3(void *obj) { // calls investor_sell
31     investor_stock_holding_t *investor_stock = (investor_stock_holding_t *)obj;
32     investor_sell(investor_stock->investor_ptr, investor_stock->holding_ptr);
33 }
34
35
36
```

2. Screenshots at breakpoints at buy/sell functions

Buy:

Registers

Register	Value
R7	0x00000000
R8	0x0000000E
R9	0x00000000
R10	0x28C5F496
R11	0x00000000
R12	0x00000002
R13 (SP)	0x20086098
R14 (LR)	0x080018AD
R15 (PC)	0x080019A6
xPSR	0x61000008

Command

```
Running with Code Size Limit: 32K
Load "G:\CEG3136 labs\lab4\Lab4.uvprojx - μVision [Non-Commercial Use License]
BS \\lab1_hello_world\svc.c:27
BS \\lab1_hello_world\svc.c:32
WS 1, 'singleton_exchange'
```

Debug (printf) Viewer

```
17 cha
18 pri:
19 }
20 void
21 cha:
22 pri:
23 }
24 }
25 void
26 inv:
27 inv:
28 }
29 }
30 void
31 inv:
32 inv:
33 }
34 }
35 }
36 }
```

Simulation

ti: 2.80944083 sec L:27 C:1 CAP NUM SCRL OVR R/W

10:47 AM 11/20/2023

Sell:

Registers

Register	Value
R7	0x00000000
R8	0x2004F2FC
R9	0x00000001
R10	0x58A818A7
R11	0x00000000
R12	0x00000003
R13 (SP)	0x20086098
R14 (LR)	0x08001885
R15 (PC)	0x08001986
xPSR	0x61000008

Command

```
Running with Code Size Limit: 32K
Load "G:\CEG3136 labs\lab4\Lab4.uvprojx - μVision [Non-Commercial Use License]
BS \\lab1_hello_world\svc.c:27
BS \\lab1_hello_world\svc.c:32
WS 1, 'singleton_exchange'
```

Debug (printf) Viewer

```
17 cha
18 pri:
19 }
20 void
21 cha:
22 pri:
23 }
24 }
25 void
26 inv:
27 inv:
28 }
29 }
30 void
31 inv:
32 inv:
33 }
34 }
35 }
36 }
```

Simulation

ti: 2.91123975 sec L:32 C:1 CAP NUM SCRL OVR R/W

10:47 AM 11/20/2023

3 & 4 Simulation Log and Source Code

The entire simulation of one run has been included in simulation.txt file found in the zip with the rest of the source code and in the same directory as this report pdf.