



**Department of Computer Science
Faculty of Computing
UNIVERSITI TEKNOLOGI MALAYSIA**

SUBJECT NAME: **COMPUTER ORGANIZATION AND ARCHITECTURE**

SUBJECT CODE: **SECR 2033**

SEMESTER: **2020/20-2**

LAB TITLE: **Programming 1: Assembly Language Fundamentals**

INSTRUCTION: **Student is required to have instructor's signature before proceed from each lab work.**

STUDENT INFO :

Name 1 : Megat Irfan Zackry Bin Ismail

Matric No. : A20EC0205

Name 2 : Muhammad Rizdwan Bin Roslan

Matric No. : A20EC0097

Section / Group: Section 06 / Group 7 B

LINK OF VIDEO: <https://youtu.be/Xnzyuh2AtR8>

SUBMITTED DATE: **4/20/2021**

REMARK(S) :

- 1) Please do all tasks in a video (Plan before start recording);
- 2) Write the link of the video above;
- 3) Submit this form (in pdf format) in e-learning.

Lab # 1

Simple program to familiarize with Program Code, Rebuild & Start Without Debugging

Execute the programs below.

i. **Part A:** Adding and Subtracting Integers

```
TITLE Add and Subtract (AddSub.asm)

;This program adds and subtracts 32-bit integers.

INCLUDE Irvine32.inc
.code
main PROC
    mov eax,10000h    ; EAX = 10000h    add
    eax,40000h        ; EAX = 50000h    sub
    eax,20000h        ; EAX = 30000h
    call DumpRegs     ; display registers
    exit main ENDP
END main
```

Experimental Results:

a) Rebuild & Start Without Debugging



Completed Fully Partially : Checked by: _____

ii. Part B: Adding Variables

```
TITLE Add and Subtract, Version 2                (AddSub2.asm)
; This program adds and subtracts 32-bit unsigned ;
; integers and stores the sum in a variable.

INCLUDE Irvine32.inc
.data
    val1 DWORD 10000h
    val2 DWORD 40000h
    val3 DWORD 20000h
    finalVal DWORD ?
.code
main PROC
    mov eax, val1      ; start with 10000h    add
    eax, val2          ; add 40000h          sub eax, val3      ;
    subtract 20000h     mov finalVal, eax ; store the
    result (30000h)    call DumpRegs        ; display
    the registers exit  main ENDP
END main
```

Experimental Results:

a) Rebuild & Start Without Debugging



Completed Fully Partially : Checked by: _____

iii. Part C: Add and Subtract 8 and 16-Bit Version

```

TITLE Add and Subtract, Version 3
; This program adds and subtracts 8 and 16 bit ;unsigned
integers and stores the sum in a variable.

INCLUDE Irvine32.inc
.data
    valw1 WORD 1000h
    valw2 WORD 4000h
    valw3 WORD 2000h
    finalValw WORD ?

    valb1 BYTE 10h
    valb2 BYTE 40h
    valb3 BYTE 20h
    finalValb BYTE ?

.code
main PROC
    mov ax,valw1      ; start with 10000h      add
ax,valw2      ; add 40000h      sub ax,valw3      ;
subtract 20000h      mov finalValw,ax ; store the
result (30000h)      call DumpRegs      ; display
the registers

    mov ah,valb1      ; start with 10000h      add
ah,valb2      ; add 40000h      sub ah,valb3      ;
subtract 20000h      mov finalValb,ah ; store the
result (30000h)      call DumpRegs      ; display
the registers
    exit main
ENDP
END main

```

Experimental Results:

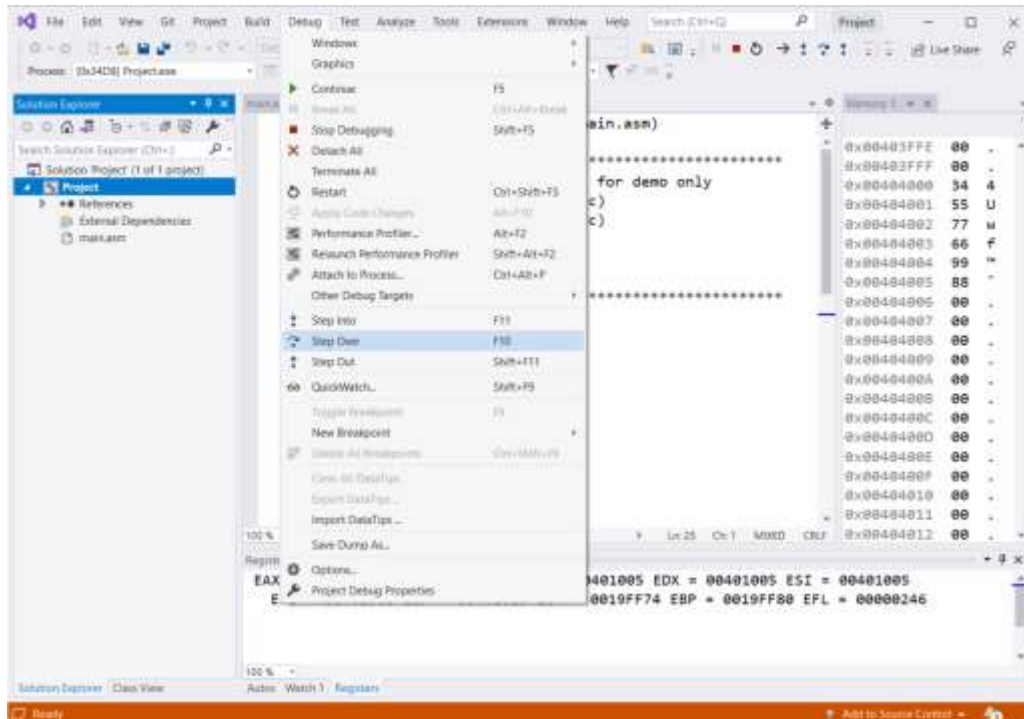
a) Rebuild & Start Without Debugging



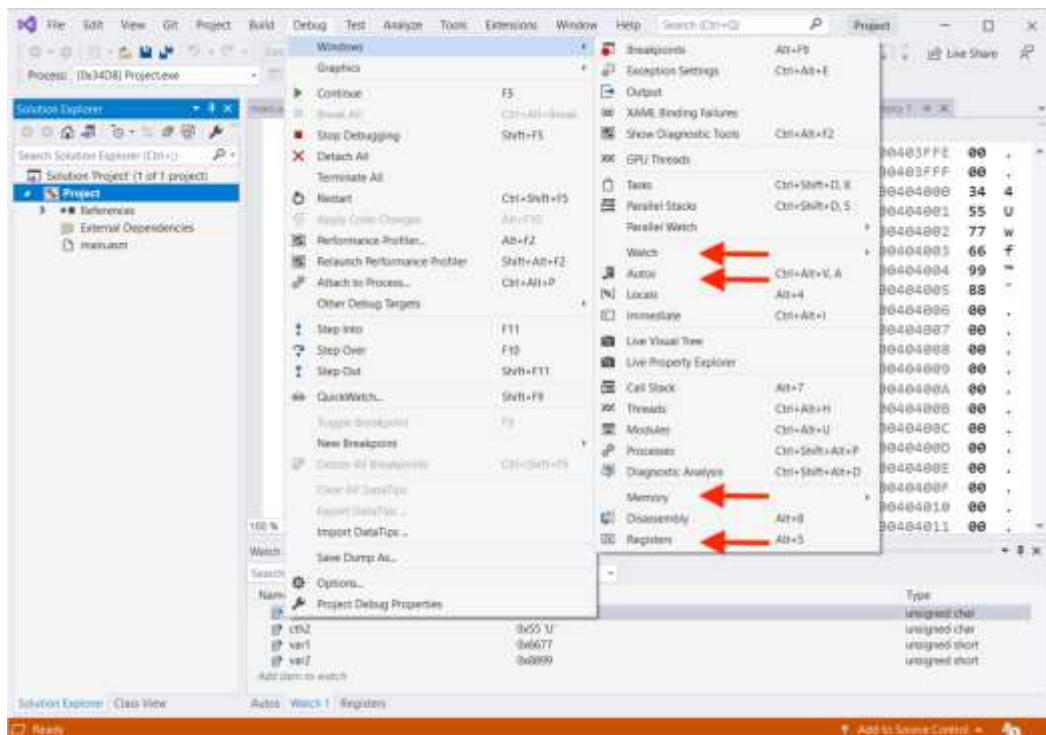
Completed Fully Partially : Checked by: _____

Detail Debugging Process

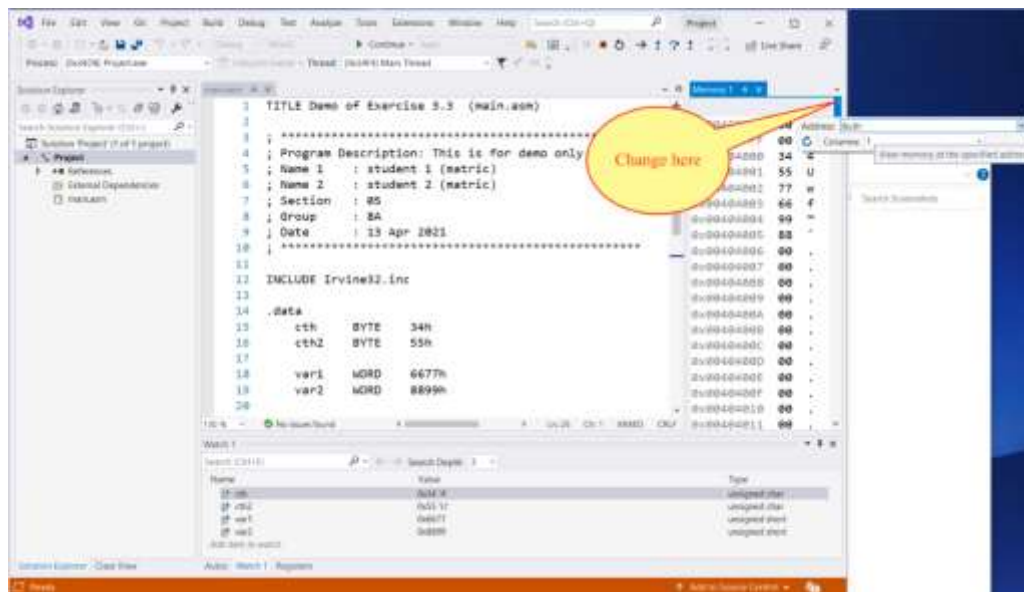
1. Press F10 for step by step debugging.



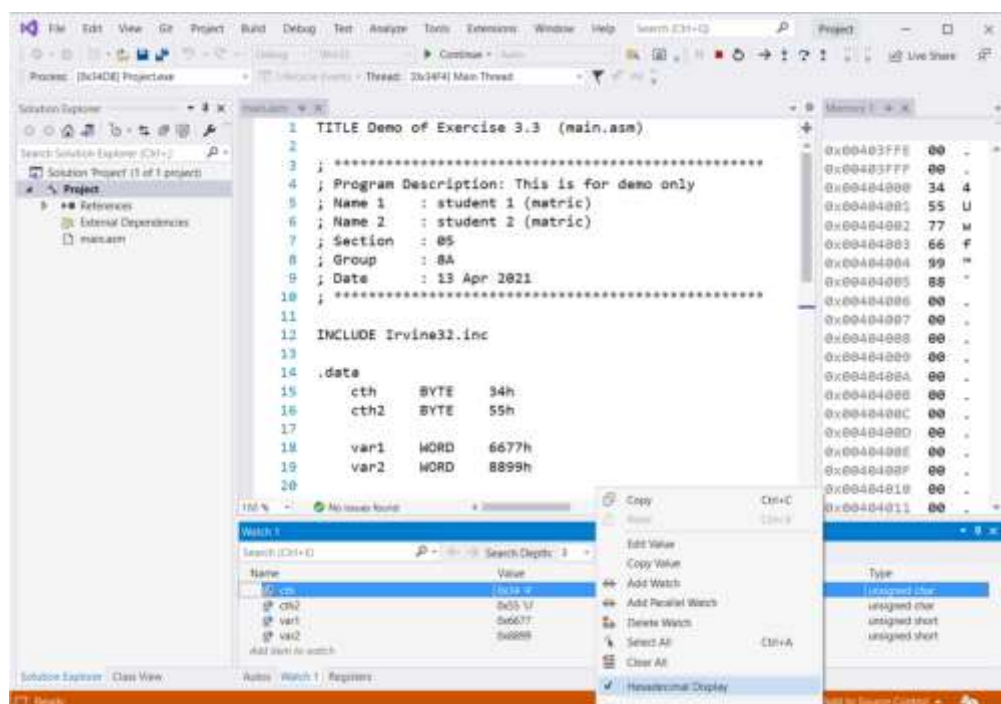
2. Open 4 windows:
- Watch
 - Autos
 - Memory
 - Registers



3. Default memory data segment value is at first variable: &cth



4. Add variables cth, cth2, var1 and var2 to Watch



(Change display in hexadecimal)

5. F10 to trace/step the assembly program line by line.

6. Please debug by looking at value changes at Watch, Memory, Autos and Registers windows.

Troubleshoot:
In case error with SAFESEH:

