



LAB 1

SUBJECT:

**SECR2033-02 COMPUTER ORGANIZATION
AND ARCHITECTURE**

LECTURER'S NAME:

Dr Aida Binti. Ali

GROUP MEMBERS:

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|------------------|-----------|
| 1. Hong Pei Geok | A20EC0044 |
| 2. Low Junyi | A20EC0071 |
| 3. Yong Zhi Yan | A20EC0172 |

Activity 1

Exercise 3.1:

What are the sequences of bytes (in hexadecimal) in storage.

```
MyData    DWORD    3740625, 2 DUP (2ABCD0Eh)
```

MyData DWORD 3740625, 2 DUP (2ABCD0Eh)

Solution 3.1:

□ 3740625 is in decimal □ 003913D1h

Offset: *Value:*

0000:	D1
0001:	13
0002:	39
0003:	00
0004:	0E
0005:	CD

Offset: *Value:*

0006:	AB
0007:	02
0008:	0E
0009:	CD
000A:	AB
000B:	02

Activity 2

Exercise 3.2:

What are the sequences of bytes (in hexadecimal) in storage.

```
MyData2    WORD    2 DUP (4Fh) , ?, 'B' , 25, 500Dh
```

MyData2 WORD 2 DUP (4Fh) , ? , 'B' , 25 , 500Dh

Solution 3.2:

□ B = 42h

□ 25₁₀ = 19h

Offset: *Value:*

0000:	4F
0001:	00
0002:	4F
0003:	00
0004:	
0005:	

Offset: *Value:*

0006:	42
0007:	00
0008:	19
0009:	00
000A:	0D
000B:	50

Activity 3

Exercise 3.3:

You are given the following code snippets. Answer these questions (in Hex).

1. Duplicate template-lab as Lab1Ex3
 2. Update main.asm with the code in the box and build project
 3. Debug the code and display the 4 windows (registers, memory, watch, autos) to get the values below
 4. Screenshot your VS2019 with the 4 windows while running debugging to put in lab report
- AH = 34H
 - AX = 3400H
 - BX = 9966H

```
.data
cth    BYTE  34H
cth2   BYTE  55H

val1   WORD  6677H
val2   WORD  8899H

.code
main PROC

MOV  AX, 0
MOV  AH, cth
MOV  BX, 0
MOV  BX, val1+1
exit
main ENDP
```

Screenshot for lab

The screenshot shows the Visual Studio Code interface with the following components:

- Top Bar:** File, Edit, View, Git, Project, Build, Debug, Test, Analyze, Tools, Extensions, Window, Help. Search (Ctrl+Q) and Project tabs are visible.
- Left Sidebar:** Solution Explorer showing the project structure: Solution 'Project' (1 of 1 project) > Project > References > External Dependencies > main.asm.
- Main Window:** Assembly code for 'main.asm' (Global Scope). The code includes Irvine32.inc and defines variables cth, cth2, val1, and val2. The main procedure starts with MOV AX, 0, MOV AH, cth, MOV BX, 0, MOV BX, val1 + 1, and ends with exit.
- Right Sidebar:** Diagnostic Tools (Diagnostics session: 0 seconds (68 ms selected)), Registers (EAX = 00193400, EBX = 00259966, ECX = 00401005, EDX = 00401005, ESI = 00401005, EDI = 00401005, EIP = 00401025, ESP = 0019FF74, EBP = 0019FF80, EFL = 00000246), Watch 1 (cth = 52 '4', cth2 = 85 'U', val1 = 26231, val2 = 34969, AX = 13312, AH = 52 '4', BX = 39270), and CPU Usage.
- Bottom Status Bar:** 100 % CPU usage, 4 errors, 0 warnings, Ln: 15, Ch: 1, TABS, CRLF.
- Bottom Panel:** Autos (Name, Value, Type), Memory 1 (Address: 0x00404002, Data: 77 66 99 88 00 00 00 00 00 00 00 00 00 00 00 00 wfm...), and Output (Show output from: Debug, 'Project.exe' (Win32): Loaded 'C:\Users\user\OneDrive\Documents\class subject slide\SE', 'Project.exe' (Win32): Loaded 'C:\Windows\SysWOW64\ntdll.dll', 'Project.exe' (Win32): Loaded 'C:\Windows\SysWOW64\kernel32.dll', 'Project.exe' (Win32): Loaded 'C:\Windows\SysWOW64\KernelBase.dll').