

Practice Environment Setup for x86

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Contents

- **Tool**
- **Assembly Code Generation**
- **VMware Environment Setting**

■ Editor

- Make a assembly code
- We use 'notepad++.exe'

■ NASM Compiler

- Make .asm file to bin file
- We use 'nasm-2.11.08-installer.exe' (Download from I-Campus)

■ VMware

- Virtual machine to run .asm file
- We use 'VMware Workstation 12 Player'



Assembly Code Generation

■ Assembly Code written in windows

■ Assembly code written in Notepad

■ Ex) HW1.asm file generation (Download from I-Campus : HW1.asm)

```
[org 0x7c00]      ; Assembly command
                  ; Let NASM compiler know starting address of memory
                  ; BIOS reads 1st sector and copied it on memory address 0x7c00
[bits 16]         ; Assembly command
                  ; Let NASM compiler know that this code consists of 16bits

[SECTION .text]   ; Text section

START:            ; Boot loader(1st sector) starts
    cli           ; Clear interrupt
    xor ax, ax    ; Initialize ax register
    mov ds, ax    ; Base address of data segment

;-----Write your code here-----
;
; Store the start address of Video Memory directly on ES Register ;
;
;-----
    sti           ; set interrupt

    call load_sectors ; load rest sectors
    jmp sector_2

load_sectors:     ; read and copy the rest sectors of disk

    push es
    xor ax, ax
    mov es, ax
    mov bx, sector_2 ; es=0x0000
    mov ah, 2        ; es:bx, Buffer Address Pointer
    mov al, (sector_end - sector_2)/512 + 1 ; Read Sector Mode
    mov ch, 0         ; Sectors to Read Count
    mov cl, 2         ; Cylinder Number=0
    mov dh, 0         ; Sector Number=2
    mov dl, 0         ; Head=0
    mov dl, 0         ; Drive=0, A:drive
    int 0x13          ; BIOS interrupt
    pop es            ; Services depend on ah value
    ret

times 510-($-$$) db 0 ; $ : current address, $$ : start address of SECTION
dw 0xAA55             ; $-$$ means the size of source
                     ; signature bytes
                     ; End of Master Boot Record(1st Sector)

sector_2:            ; Program Starts
    cli

;-----Write your code here-----
```

Compile the Assembly Code

■ Compile the Assembly Code in windows

■ Install NASM compiler

■ Download from I-Campus : nasm-2.11.08-installer.exe

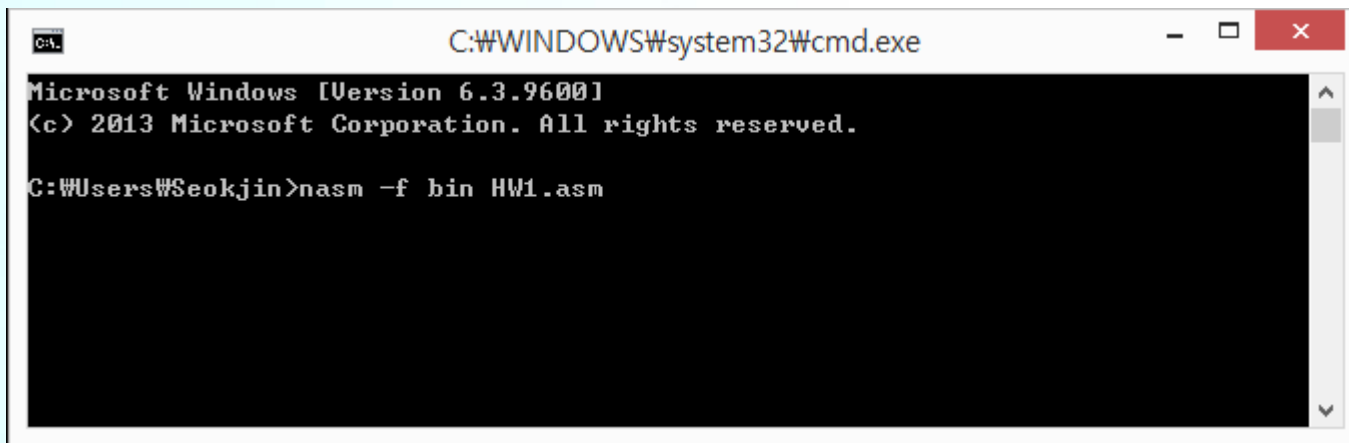
■ Run NASM compiler

■ Go to the path of the assembly code file

■ Compile the Assembly Code with the following command

■ `nasm -f bin -o filename.bin filename.asm`

→ filename.bin file generation



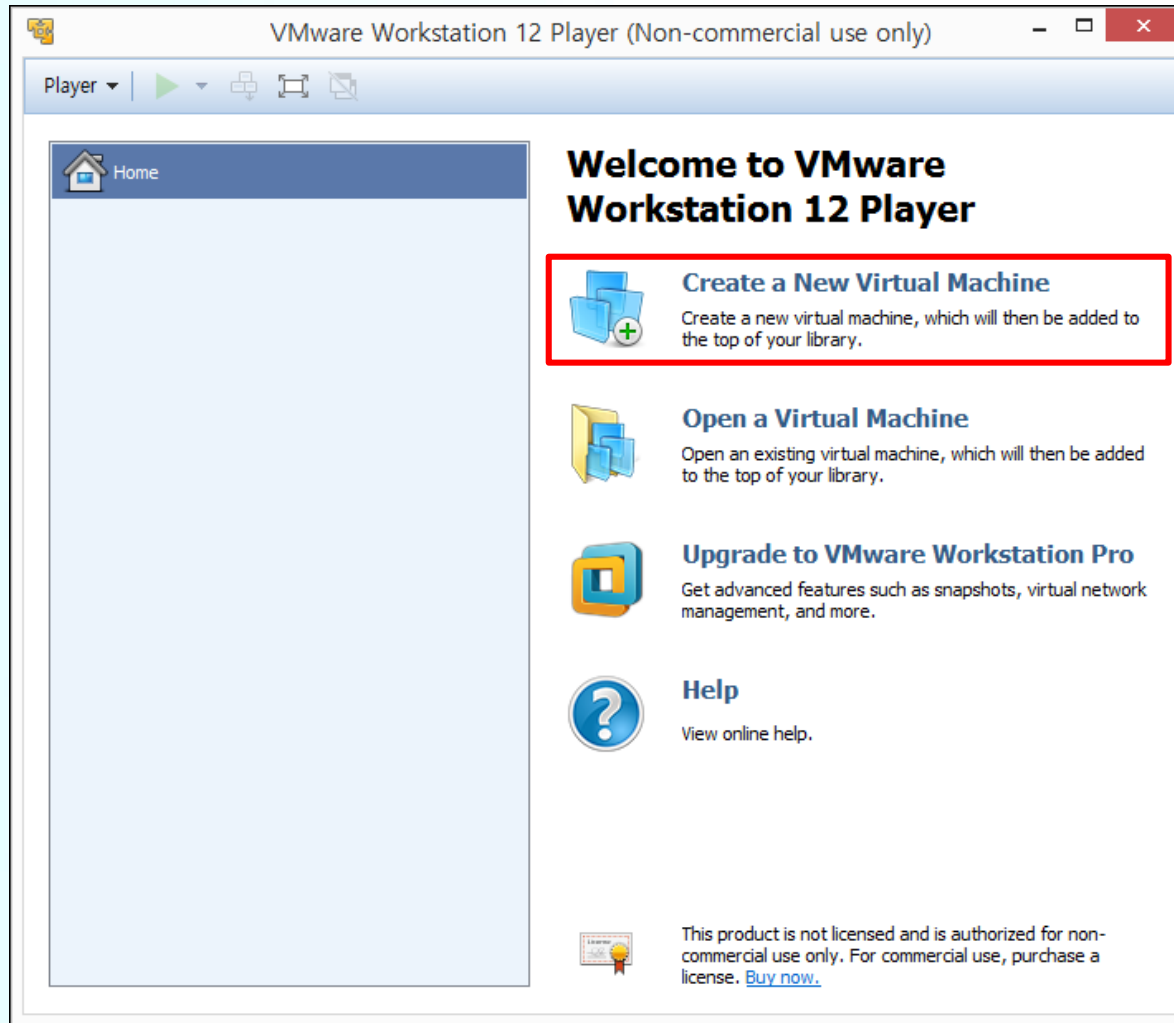
```
C:\WINDOWS\system32\cmd.exe
Microsoft Windows [Version 6.3.9600]
(c) 2013 Microsoft Corporation. All rights reserved.

C:\Users\Seokjin>nasm -f bin HW1.asm
```

VMware Environment Setting

■ VMware Configuration

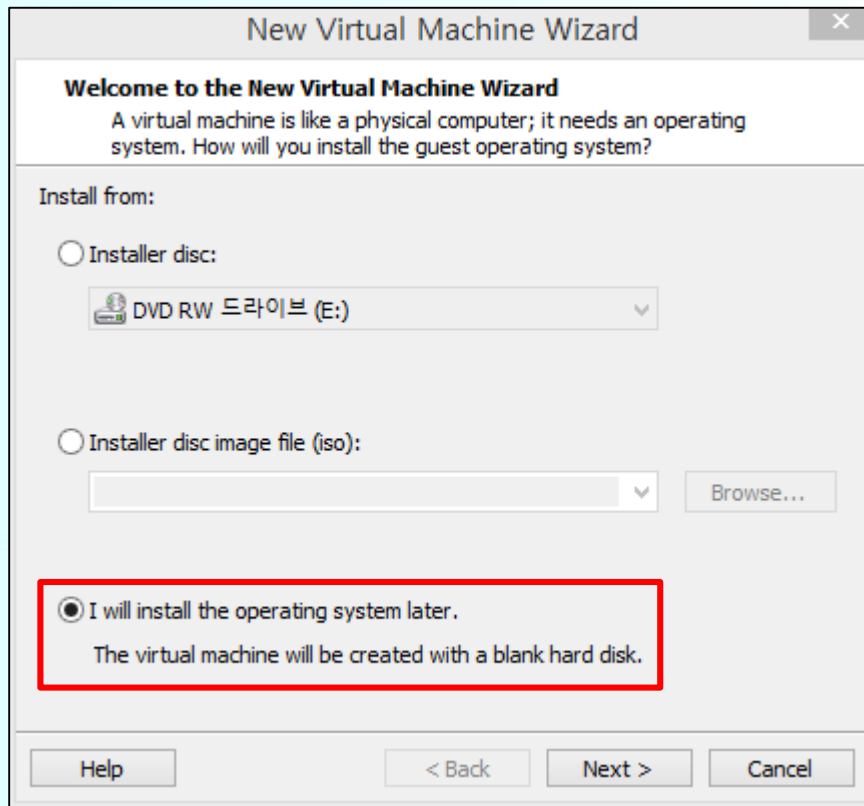
■ Create a New Virtual Machine Click



VMware Environment Setting

■ VMware Configuration

■ Select as shown below



New Virtual Machine Wizard

Welcome to the New Virtual Machine Wizard
A virtual machine is like a physical computer; it needs an operating system. How will you install the guest operating system?

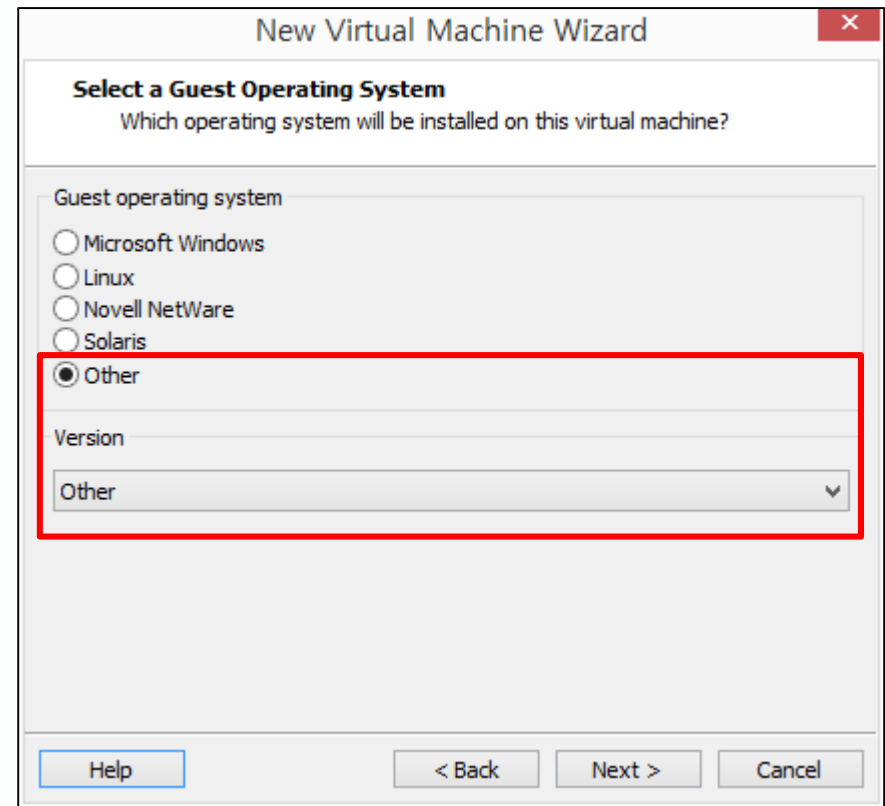
Install from:

☐ Installer disc:
DVD RW 드라이브 (E:)

☐ Installer disc image file (iso):
Browse...

☒ I will install the operating system later.
The virtual machine will be created with a blank hard disk.

Help < Back Next > Cancel



New Virtual Machine Wizard

Select a Guest Operating System
Which operating system will be installed on this virtual machine?

Guest operating system

☐ Microsoft Windows
☐ Linux
☐ Novell NetWare
☐ Solaris
☒ Other

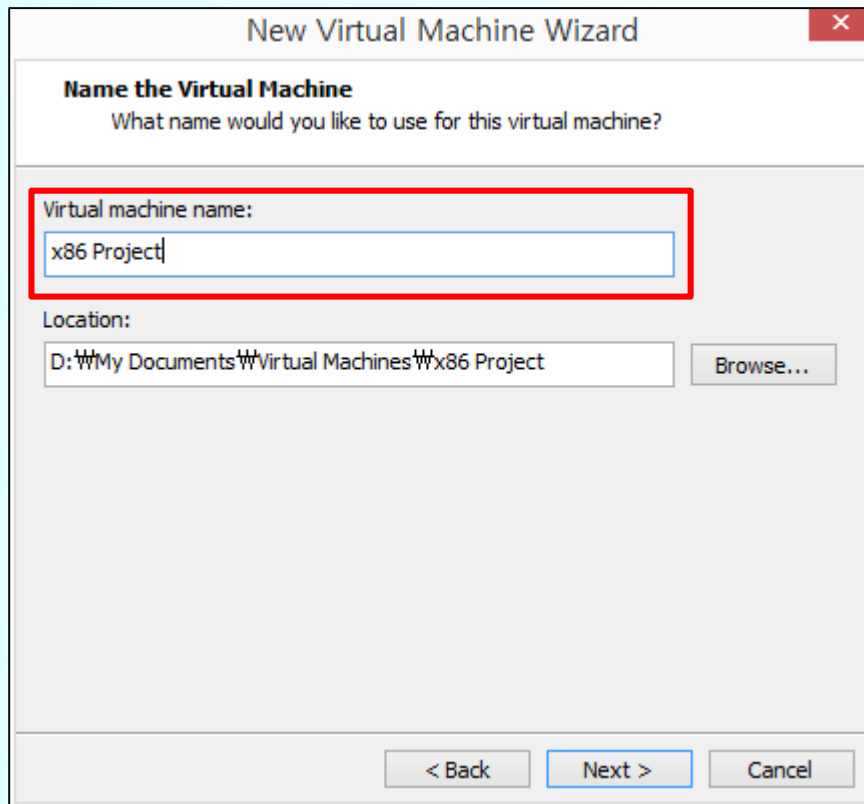
Version
Other

Help < Back Next > Cancel

VMware Environment Setting

■ VMware Configuration

- Write your machine name
- Select as shown below



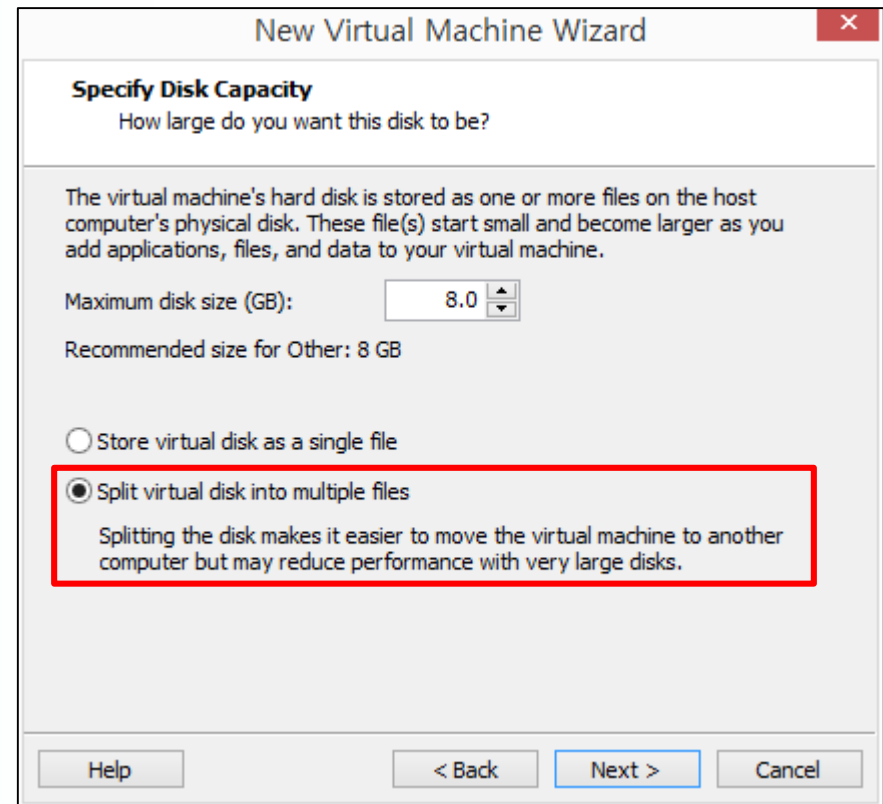
New Virtual Machine Wizard

Name the Virtual Machine
What name would you like to use for this virtual machine?

Virtual machine name:
x86 Project

Location:
D:\My Documents\Virtual Machines\X86 Project

< Back Next > Cancel



New Virtual Machine Wizard

Specify Disk Capacity
How large do you want this disk to be?

The virtual machine's hard disk is stored as one or more files on the host computer's physical disk. These file(s) start small and become larger as you add applications, files, and data to your virtual machine.

Maximum disk size (GB): 8.0

Recommended size for Other: 8 GB

☐ Store virtual disk as a single file

☒ Split virtual disk into multiple files

Splitting the disk makes it easier to move the virtual machine to another computer but may reduce performance with very large disks.

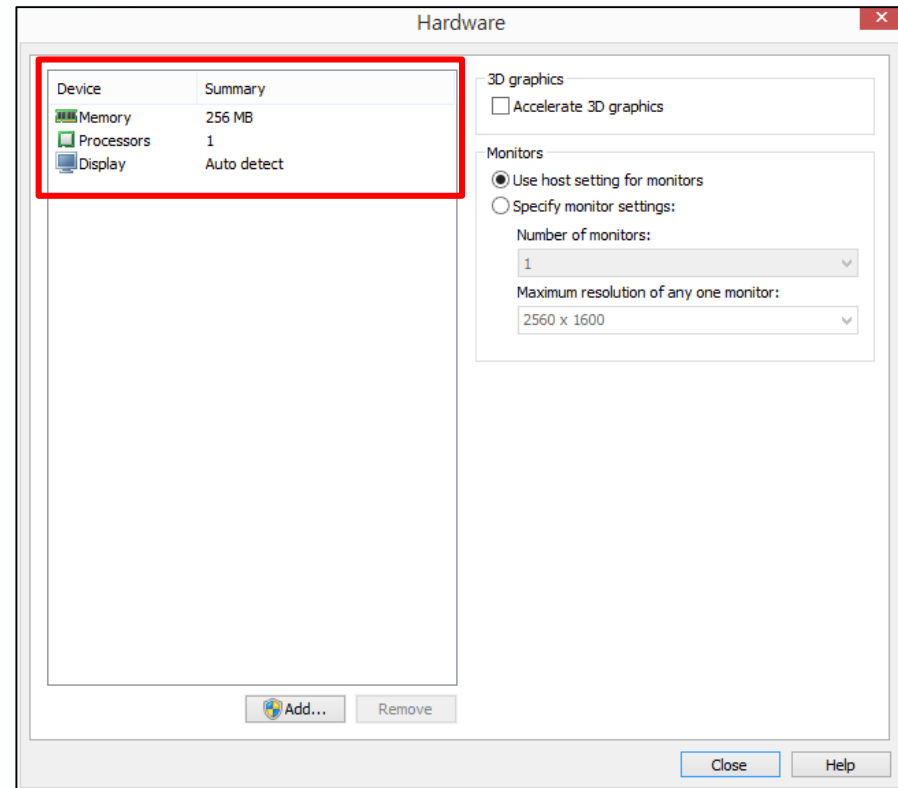
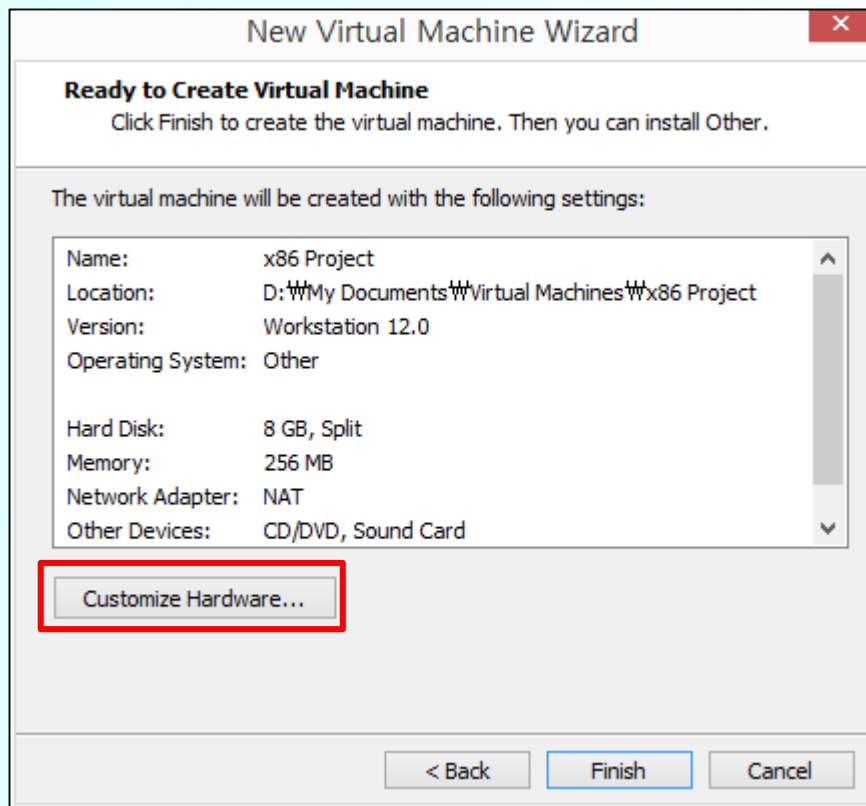
Help < Back Next > Cancel

VMware Environment Setting

■ VMware Configuration

■ Select the device then remove using Remove button

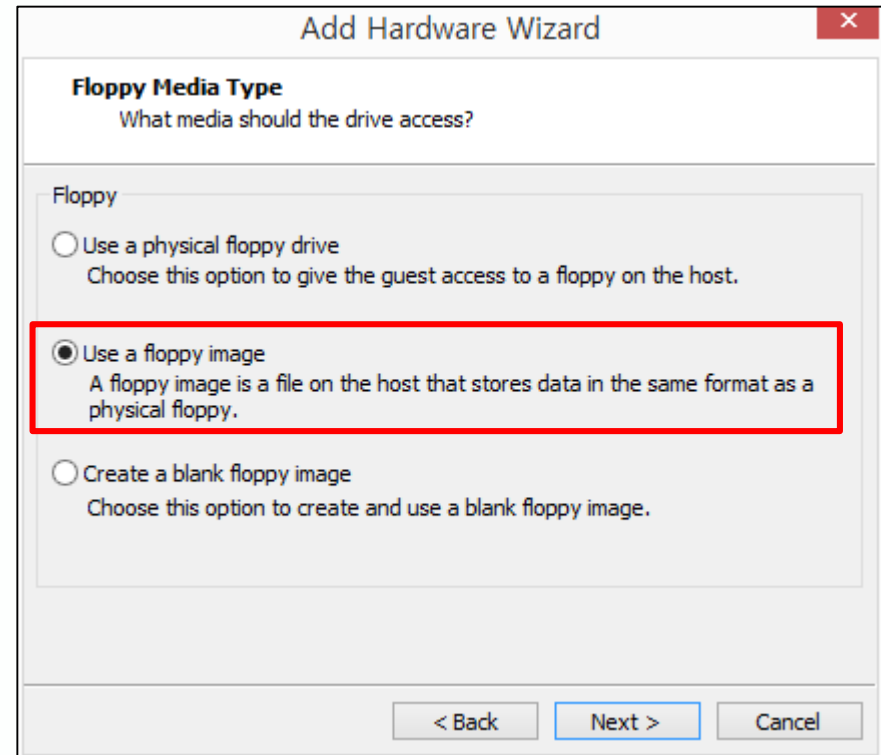
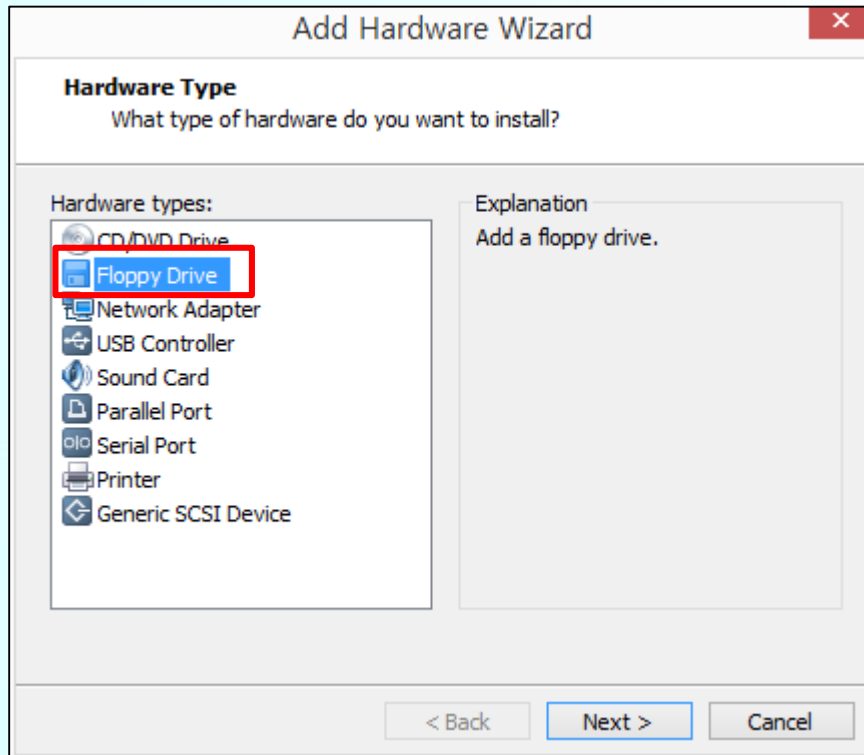
■ Except for Memory, Processors, Display



VMware Environment Setting

■ VMware Configuration

- Add Floppy Drive device using Add button
- Select as shown below

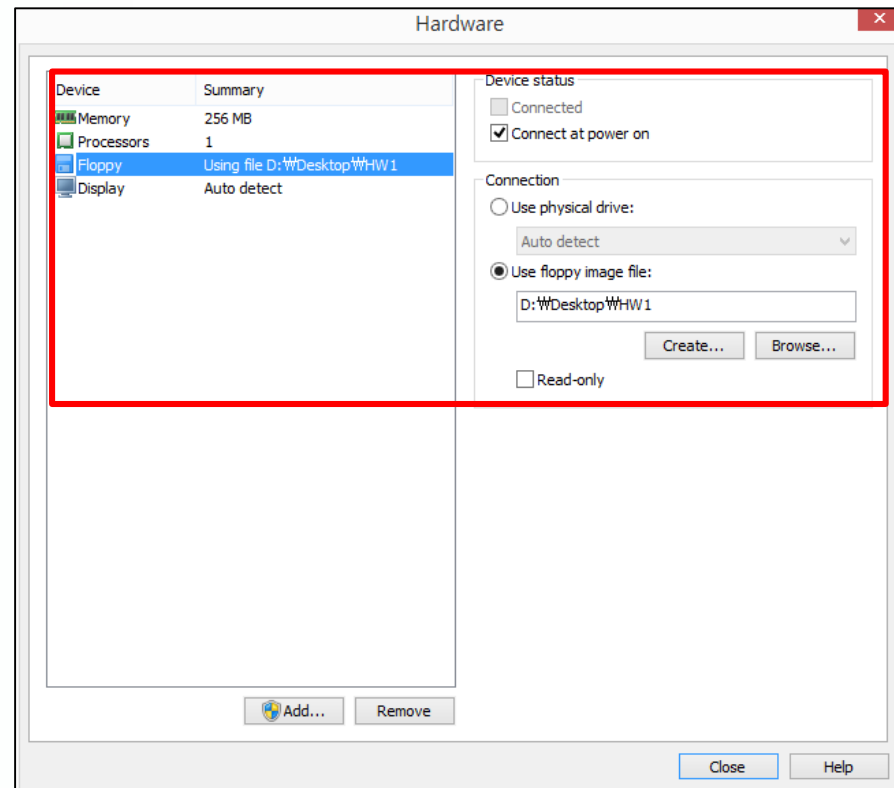
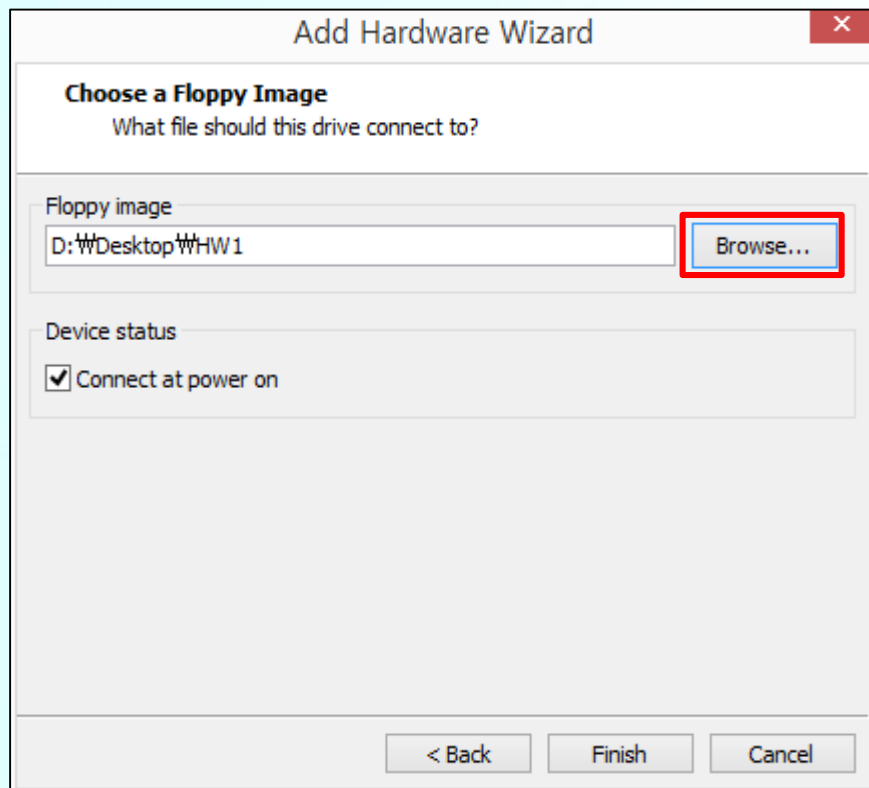


VMware Environment Setting

■ VMware Configuration

■ Import your test file(.bin file) to floppy

■ Search and select any file format



VMware Environment Setting

- **VMware Configuration Complete**
 - Click the Play virtual machine button
 - Then VMware will start your test.asm code

