

Programming Assignment Lecture I

Introduction

Xie

xiemhemail@gmail.com

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Basic Info

- ▶ Course Content
 - ▶ PA1-PA??
- ▶ Time
 - ▶ ???
- ▶ Assessment methods
 - ▶ Submit project and report.
 - ▶ Before **stage's deadline**.
- ▶ **Instruction**
 - ▶ <https://nju-ics.gitbooks.io/ics2017-programming-assignment/>
 - ▶ Please check the "news" module of website at least once each day.

Teacher and T.A.s

emmmmm

Resources

Platform and tools IA-32 + GNU/Linux + gcc + C

Guidebook <https://nju-ics.gitbooks.io/ics2017-programming-assignment/>

Skeleton <https://github.com/NJU-ProjectN/ics-pa>

Tip

You can download the PDF or epub version of guide in github.

Programming Assignment Lecture I

- 1 From Computer System, to ICS, to PA
- 2 How we emulate a computer? → The story of computer
- 3 Help you do it! → Brand new PA

Why we need learn ICS? – yzh

Motivation

Question

```
int main()
{
    printf("Hello World");
    return 0;
}
```

What the computer are doing when you execute the program above ?

Tip

This may appear in exams.

System Stack

| |
|-------------------------------------|
| Application |
| Algorithm |
| Programming Language |
| Operating System/Virtual Machines |
| Instruction Set Architecture |
| Micro-architecture |
| Register-Transfer Level |
| Gates |
| Circuits |
| Devices |
| Physics |

What you'll get after finishing PA

- You'll
- ▶ **Get Systems thinking**
 - ▶ Understand how program run on a computer
 - ▶ Enhance **coding** ability
 - ▶ Prepare for later courses (OS, Compiling)
- Way Complete a tiny but entire computer system and run program on it.
- PA **NEMU** (i.e. NJU Emulator)

Question

What is an *emulator*?

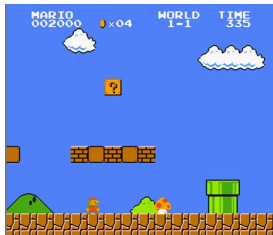
What is an *emulator*?

Emulator –Wikipedia

In computing, an **emulator** is hardware or software that enables one computer system (called the *host*) to behave like another computer system (called the *guest*).

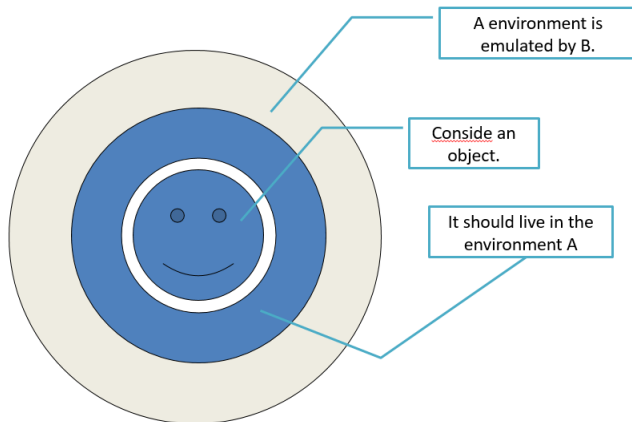
An emulator typically enables the host system to run software or use peripheral devices designed for the guest system.

What is an *emulator*?



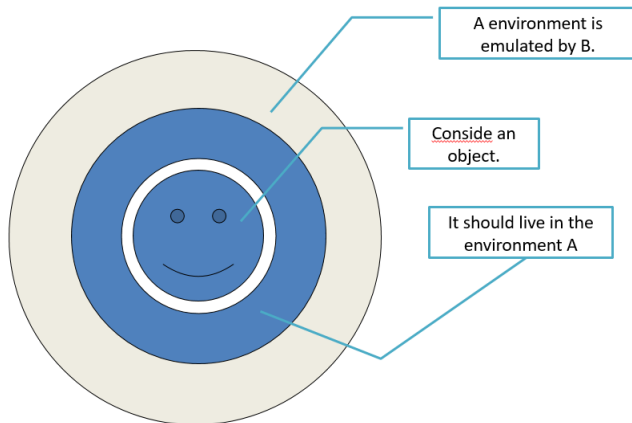
What is an *emulator*?





Question

Does the object know he is living in a virtualized environment?



Reference Answer

He can't distinguish whether he lives in an virtual environment.

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DLC

- ▶ Most of you have completed the Digital Logic Circuit Course.(Taught by 张泽生吴海军)
 - ▶ summator
 - ▶ register
 - ▶ multiplexer
 - ▶ *etc.*
- ▶ Logic Gate → digital logic device → Computer

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Structure of PA

```
ics2017
|---nanos-lite      # mini operating system kernel
|---navy-apps       # apps
|---nemu            # NEMU
|---nexus-am        # abstract machine
```

The End

