CHAPTER

1

INTRODUCTION

PART 2

TRUONG DAI HOC KHOA HOC TU NHIEN
KHTN
TP. HO CHI MINH

cdio 4.0

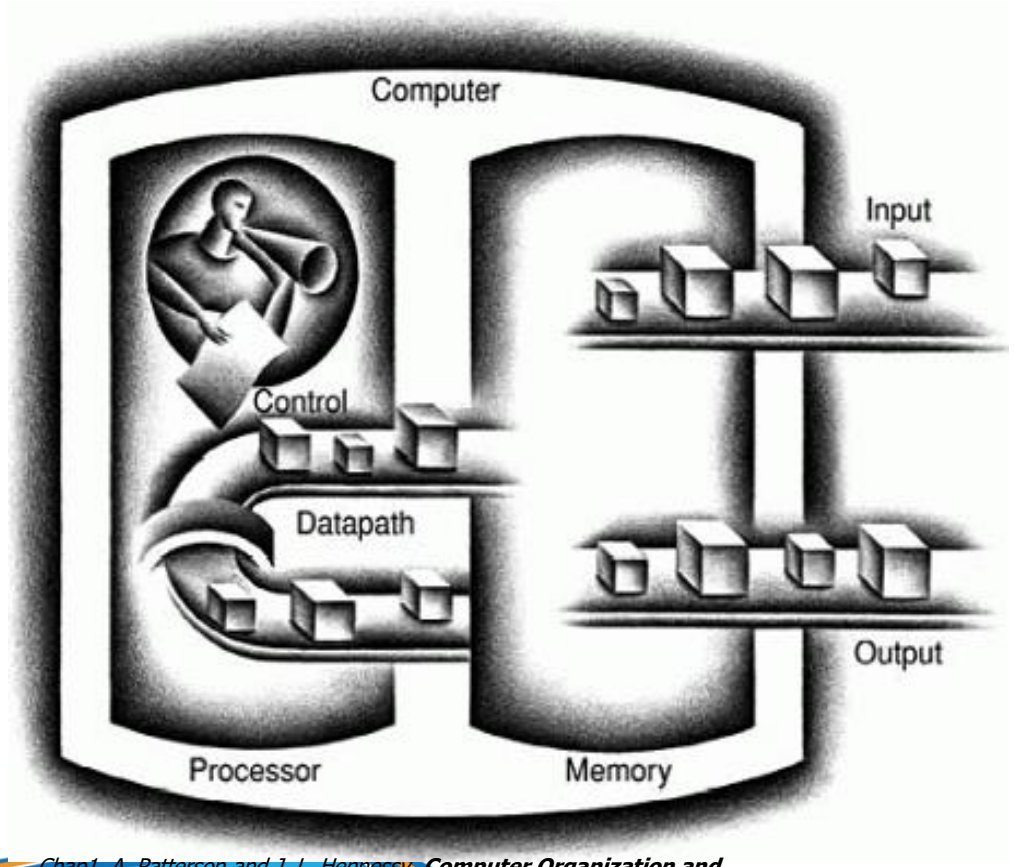
KHOA CÔNG NGHỆ THÔNG TIN
TRƯỜNG ĐẠI HỌC KHOA HỌC TỰ NHIÊN

fit@hcmus

What will you learn?

- Basic components of a privacy computer (hardware interface)
- Inside a Processor
- Level of program code
- Abstraction layer (hardware & software)

Components of a Computer



Chap1, A. Patterson and J. L. Hennessy, ***Computer Organization and Design: The Hardware/Software Interface,5th ed, 2014*** Figure 1.5

Same components of all kinds of computer

1. Input (mouse, keyboard, …)
2. Output (display, printer, …)
3. Memory:

   Main memory (DRAM), cache (SRAM), secondary (disk, CD, DVD, …)
4. Datapath } *Processor*
5. Control } *(CPU)*

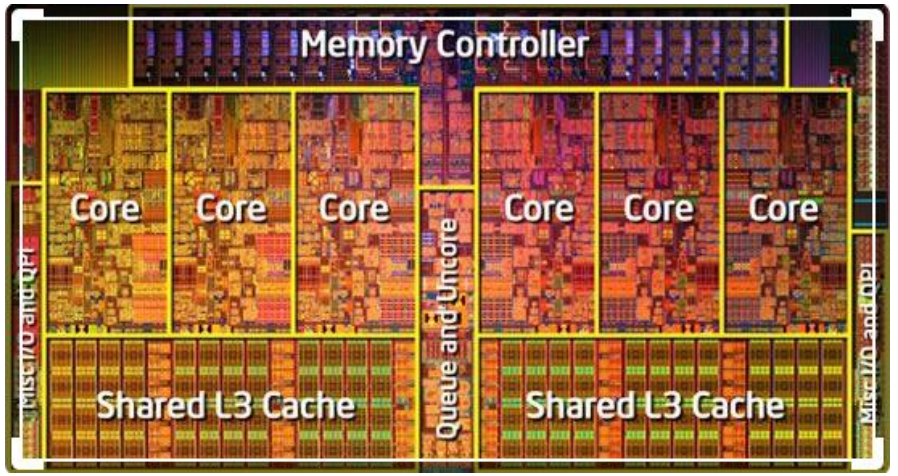
Inside the Processor

- Central Processing Unit - CPU
  - Datapath: performs operations on data
  - Control: sequences data-path, memory,

    ...
  - Cache memory:

    Small fast SRAM memory for immediate

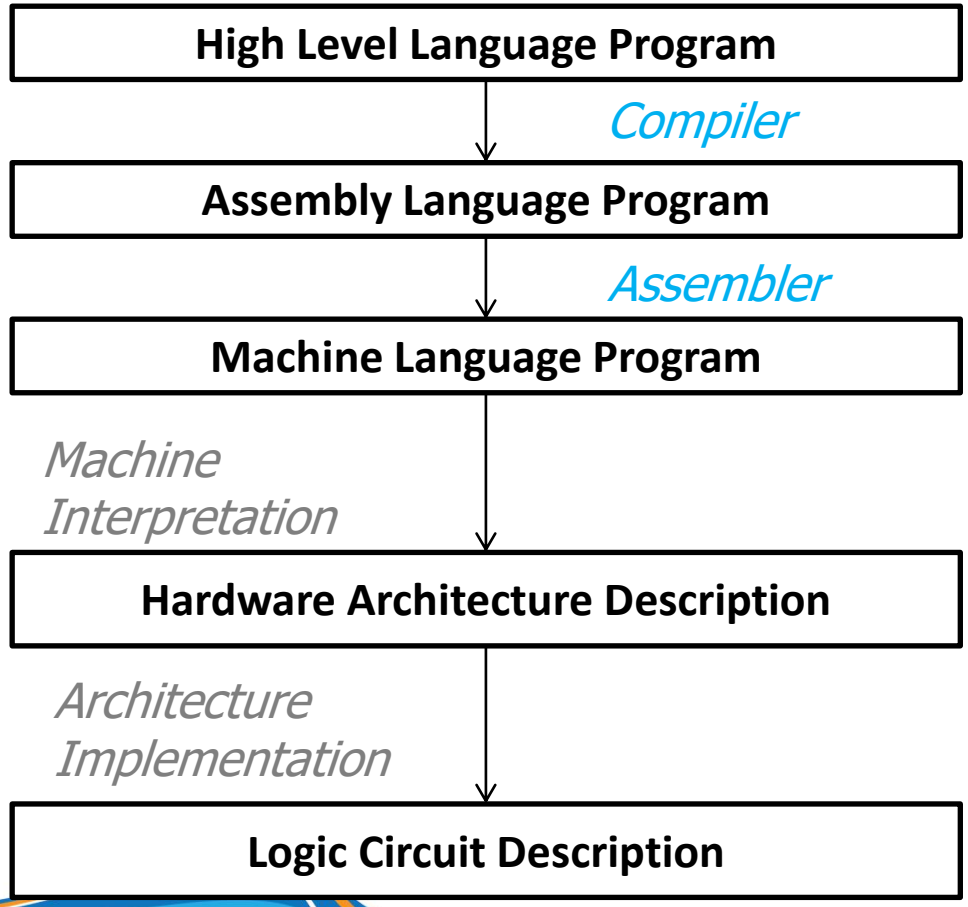
    access to data



https://www.pinterest.com/pin/381117187187475687/visual-search/?x=10&y=10&w=530&h=274&cropSource=6

The Inside of Intel Core i9 six core Processor

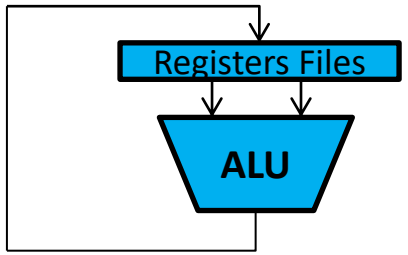
Level of Program Code

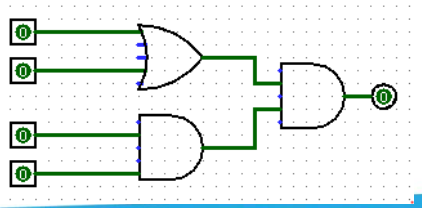
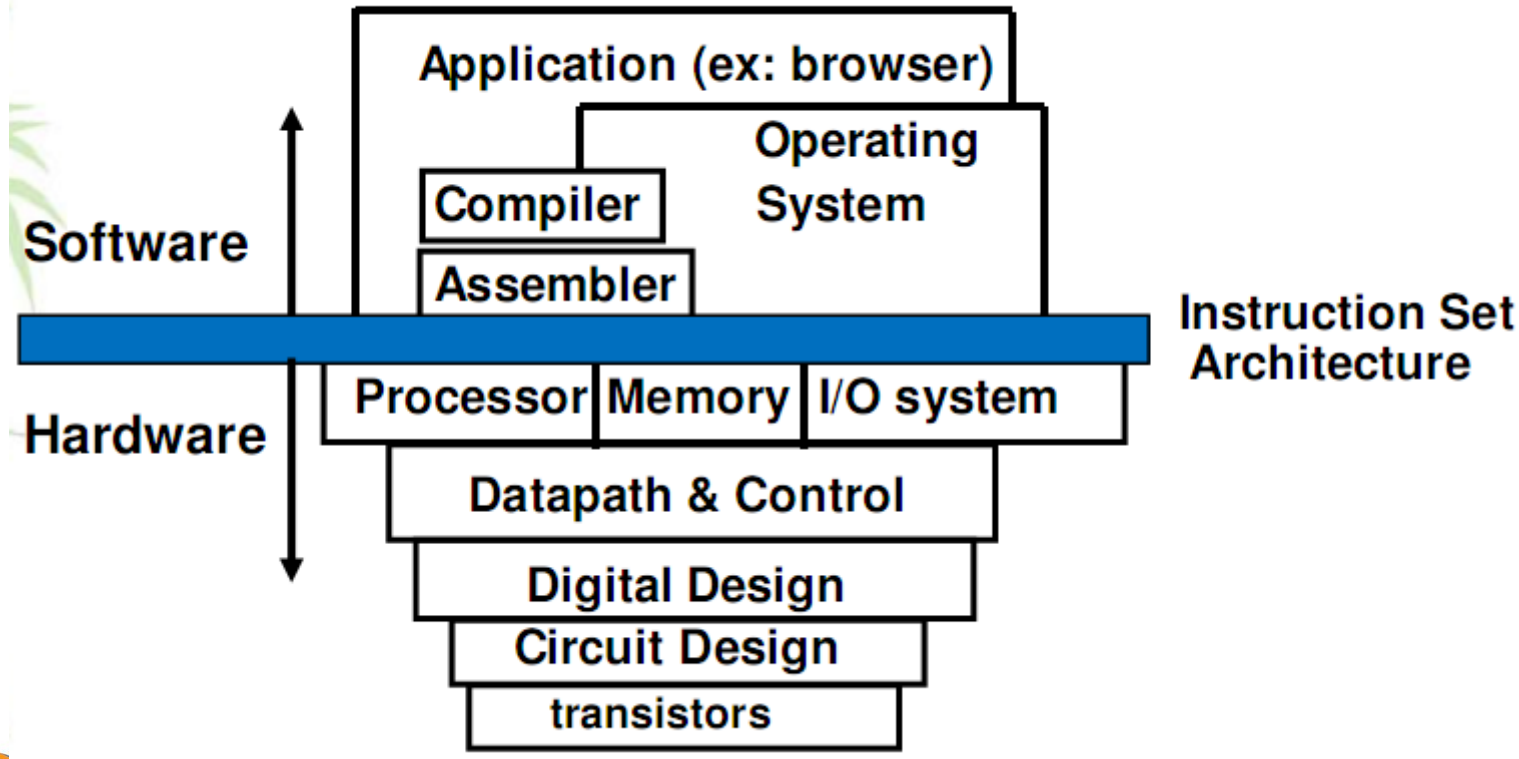



```
temp = v[k]
v[k] = v[k+1]
v[k] = temp
```

```
lw $t0, 0($2)
lw $t0, 4($2)
sw $t1, 0($t2
sw $t1, 4($t2)
```

```
0000 1001 1100 0110 1010 1111 0101 1000
1010 1111 0101 1000 0000 1001 1100 0110
1100 0110 1010 1111 0101 1000 0000 1010
0101 1000 0000 1001 1100 0110 1010 1111
```





Abstraction layer