۹۸/۱۱/۲۹ جلسه اول

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Advanced Programming with C++

⇒ Object Oriented Programming (OOP)

⇝ Why we need to learn AP?

- learn How to do less coding and Provide more functionalities
- learn How to reuse codes (library)
- " " " make more efficient
  - less memory
  - less execution time
- get familiar with popular libraries

Qt ⇝ GUI (Graphical User Interface)

std::thread ⇝ multithreaded / socket Programming

Ref. 1. C++ How to program Deitel & Deitel
9th C++ 11

2. C++, The complete Reference
Herbert Schildt

Online: → cplusplus.com
tutorialspoint.com/cpluplus

Grading Policy:

8 pt.	Final exam (60% coding, 40% theory)
5 pt.	Midterm exam (60% theory, 40% coding)
3 pt.	Final Project
3 pt.	exercises
2 pt	Class Activities
21	

course syllabus:

1. Basics & concepts
2. A quick review on C
3. C vs. C++
4. OOP with C++
   - 4_1. Concepts & basics (class, obj, ...)
   - 4_2. Template class & functions
   - 4_3. Function & operator overloading
   - 4_4 Inheritance
   - 4_5 Polymorphism
   - 4_6 Object-Oriented Design
   - 4_7 Name spaces
   - 4_8 GUI Programming with Qt
   - 4_9 Exception Handling
   - 4_10 STL (Standard Template Library)
   - 4_11 Multi threading
   - 4_12 Socket Programming
   - 4_13 web programming

Programming Paradigm

- Machine Code ✗ (0100 ↑)
- Assembly Code
  Mov AX, BX
- High level language
  → Procedural (C, cobol...

if for while

High-level language → object-oriented language

C++ ~> C with classes

Stroustrop simula 67

C++

95

98

03

11

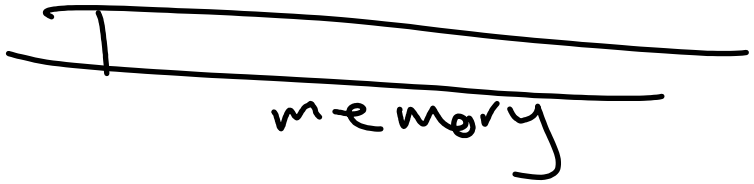
17

20

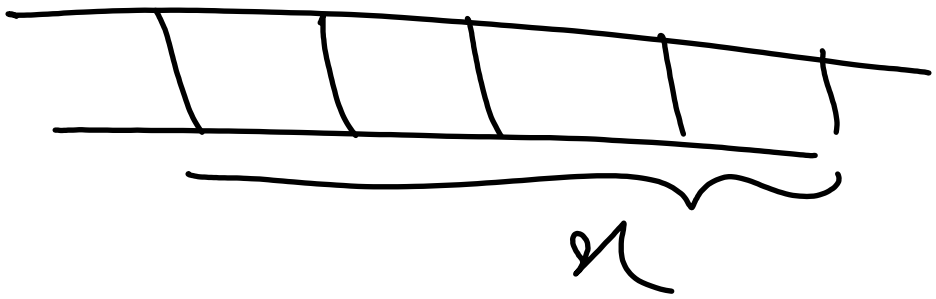
"To make effective use of object-oriented Principles, requires one to view the world in a new fashion. But simply using an Object Oriented language (such as C++) does not, by itself, force one to become object-oriented

An introduction on OOP
By Timothy Budd

C :



Data Type
- Primitive (Primary)
  - int → 4byte
  - char → 1byte
  - float → 4 byte
  - double → 8 byte
- user defined → typedef ....
- Derived →
  - Struct
  - Array
  - Union
  - enum



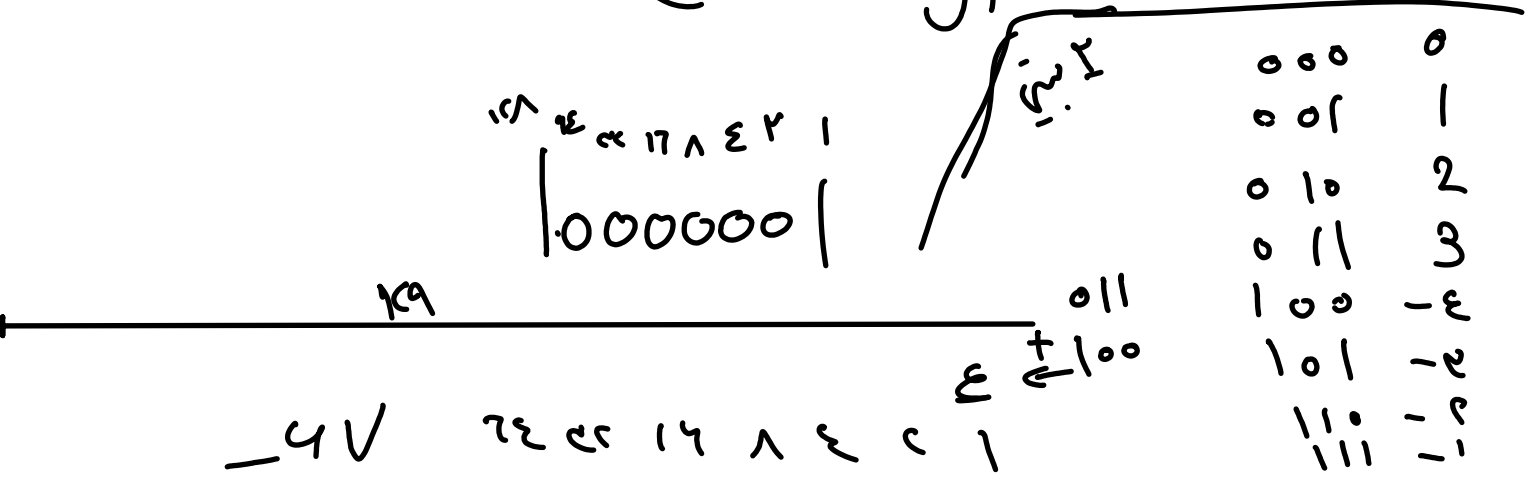
int x

x + 2

char
signed
unsigned

c = 129;

c 1 byte



printf("%s ", ———)

%4d

%-10d ——— 123 ———

scanf("%s ", str)

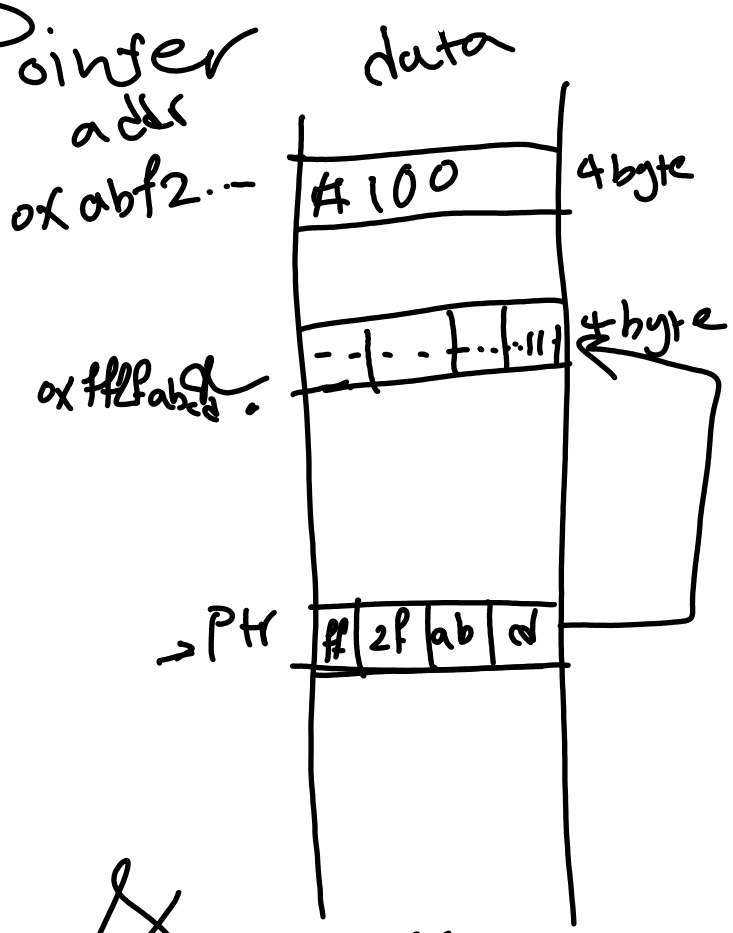
"%d ", &a)

scanf("%d/%d/%d", &year, &month, &day)

12/abc---

<stdio.h>

Pointer




```
int x;
x = 12;
int * ptr;
Ptr = &x;
printf("%d", *ptr)
    ↳ 12
printf("%P", ptr)  0xff...
(*ptr)++
```

&

*

int

```
int * a, *b;
```

✓ a + 2

✗ a + b

✓ a - b

a++ → 4byte

✗ *

printf((*(ptr ++)))

(*ptr) ++

(sizeof(++(*ptr)))

ptr ++;

*ptr