

# 시스템 프로그래밍을 위한 C언어

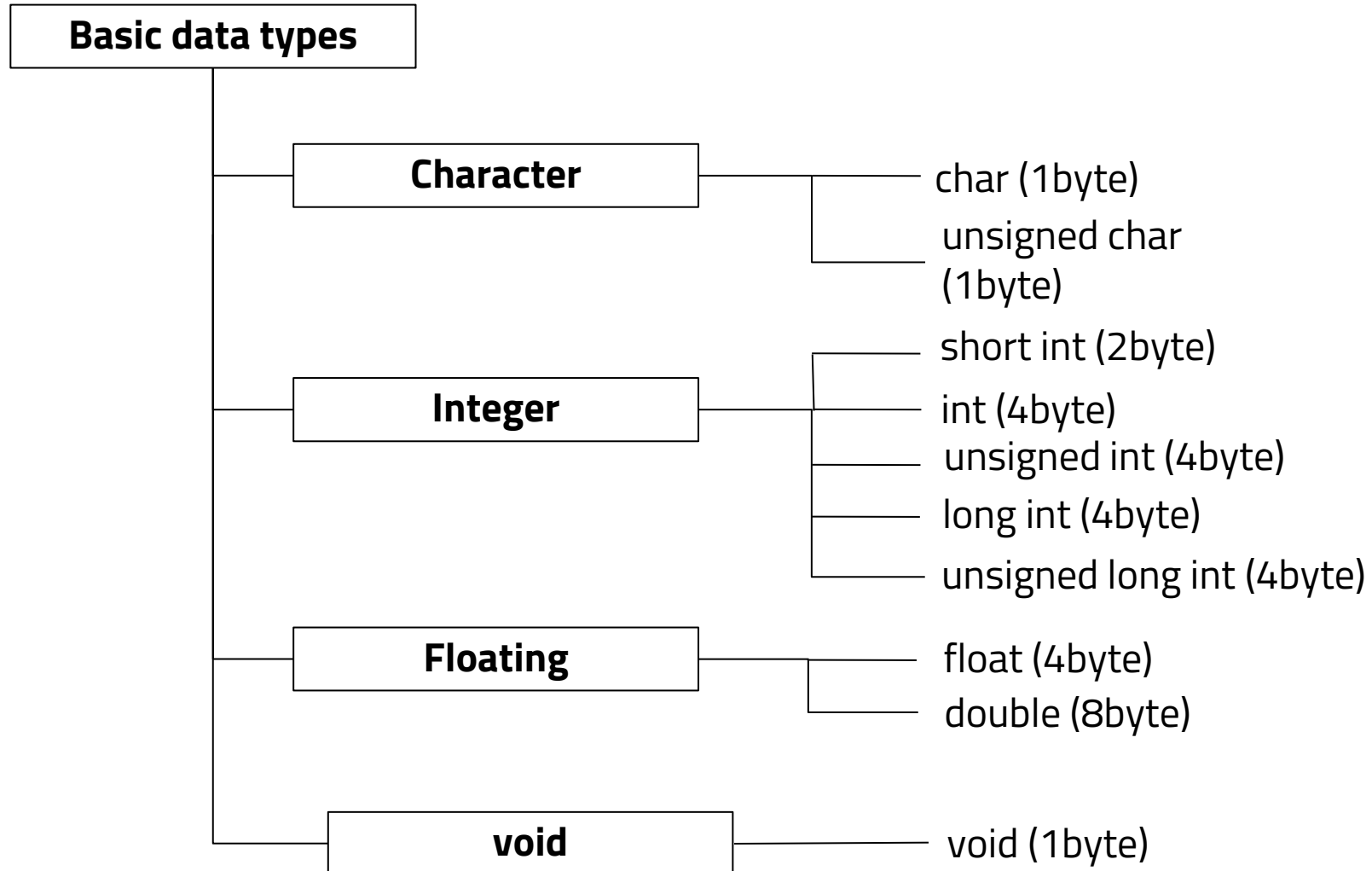
## Variable & Address & Memory Allocation

현대자동차 입문교육  
박대진 교수

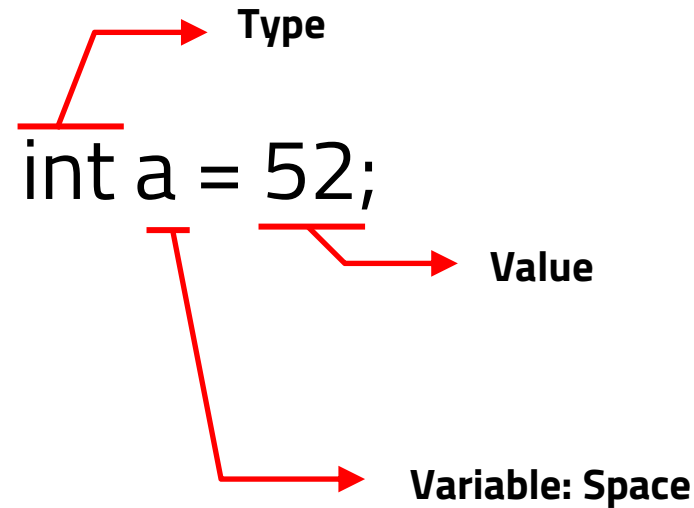
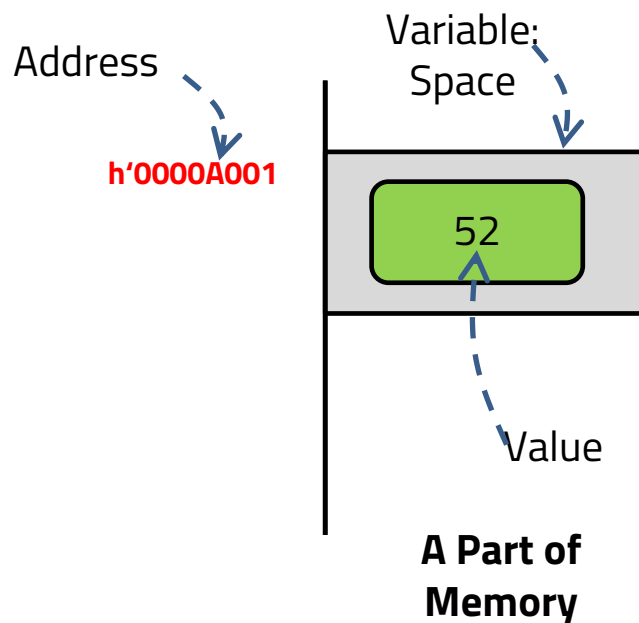
# Lecture Lessoned

- C언어 복습
- 변수와 값
- 변수의 타입과 주소
- 포인터 변수
- 지역변수, 전역변수
- static, extern
- 구조체
- 복수의 파일로 구현

# Basic Data Types (typical size)



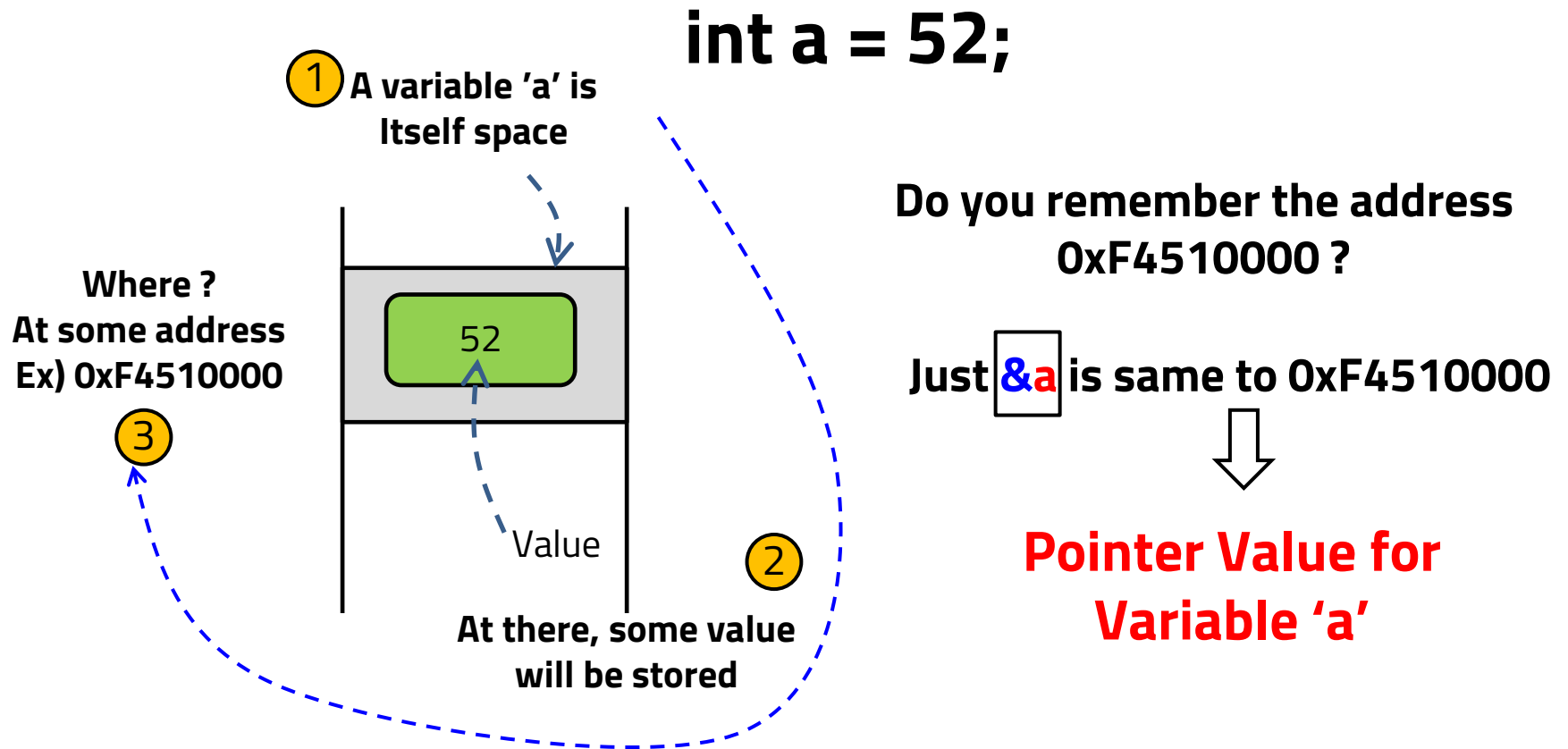
# Type vs. Address vs. Variable vs. Value



**Address of variable: &a**  
**Space of variable: a**  
**Value of variable: 'd52**

# Pointer: Address of Variable

- All Variable will be allocated in address space somewhere



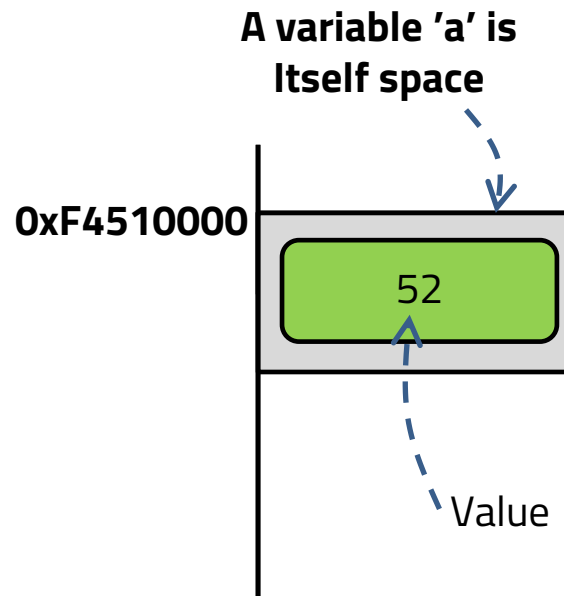
# Pointer Type's Variable

- A variable holding an address value of variable

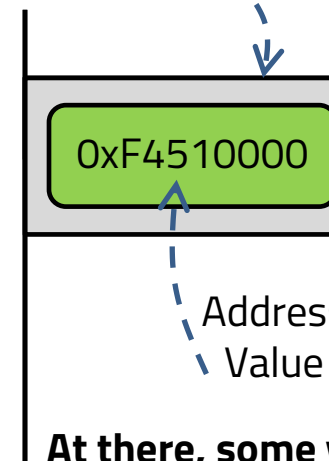
```
int a = 52;
```

```
int* ap;
```

```
ap = &a;
```



A pointer variable 'ap' is  
Itself space



At there, some value will be stored  
**But value is specially address**

# Accessing Original Variable by using Pointer Variable

- Dereferencing

```
int a = 52;
```

```
int* ap;
```

```
ap = &a;
```

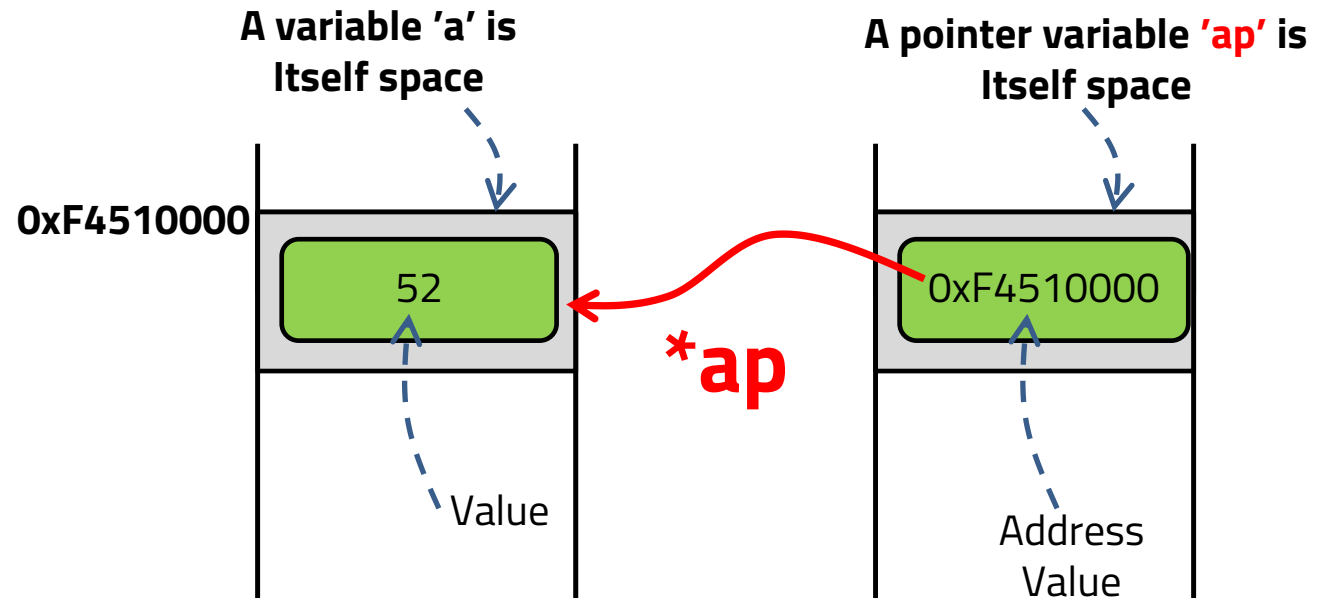
```
*ap = 100;
```

same

```
*(&a) = 100;
```

same

```
a = 100
```



# Constant

## ◆ Integer constants value

`int decimal = 123;`

← decimal

`int octal = 0123;`

← octal

`int hex = 0x123;`

← hexadecimal

`unsigned int unsigned_decimal = 123U;`

← unsigned 2 bytes

`long int long_decimal = 123L;`

← long 4 bytes

## ◆ Floating constants value

`float pi1 = 3.14F;`

4 bytes

`double pi2 = 3.14;`

8 bytes

`long double pi3 = 3.14L;`

16 bytes

Size of vars is depend on processors

## ◆ const keyword in variable declaration

`const float pi = 3.14;`

`float pi = 3.14;`

`pi = 3.1415;`

`pi = 3.1415;`

➡ **Error** – constant variable can not be changed by assignment



# Constant

```
char ch = 'a';
```

## ◆ Character constants

- ❖ A character constant is 1 character enclosed in single quotes ' ' (exception : escape sequence)
- ❖ The value of character constant is the numeric value of the character in the machine's character set.
  - Ex. ASCII character set  
the value of '0' = 48

### ❖ Escape Sequence

\a	alert (bell) character	\\	backslash
\b	backspace	\?	question mark
\f	formfeed	\'	single quote
\n	newline	\"	double quote
\r	carriage return		
\t	horizontal tab		