

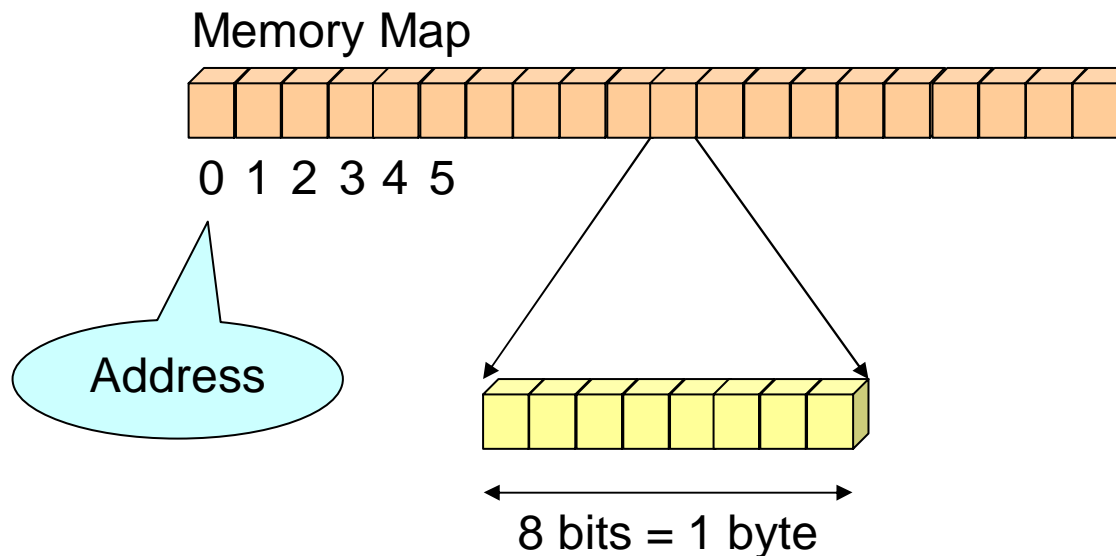
Understanding Computer Programming



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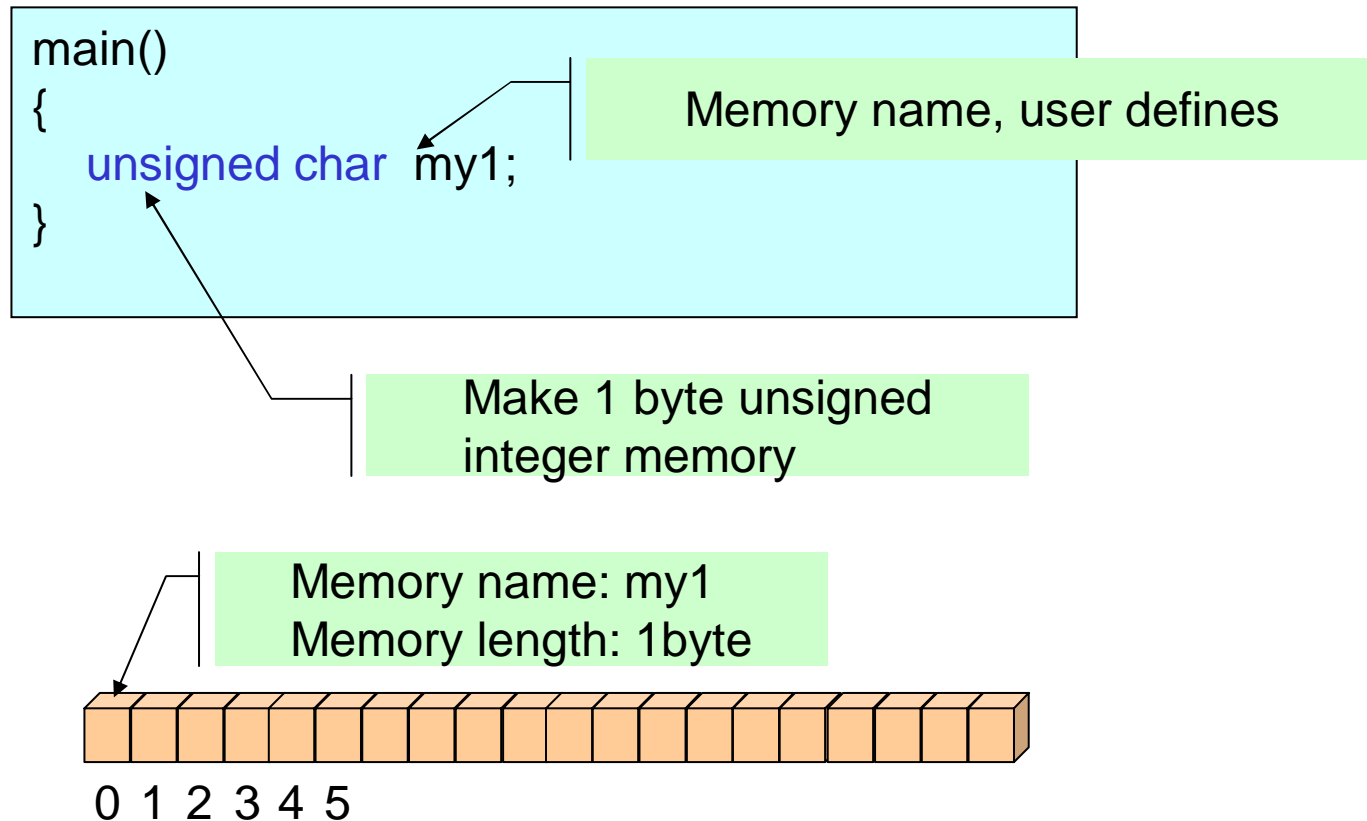
Understanding Memories (Variables)

- Memory types in C-language
 - Minimum length of memory: 1 bit
 - 1 bit memory can save 0 or 1
 - Address is allocated every 8 bit, i.e. 1 byte
 - 1 byte memory can save 0~255

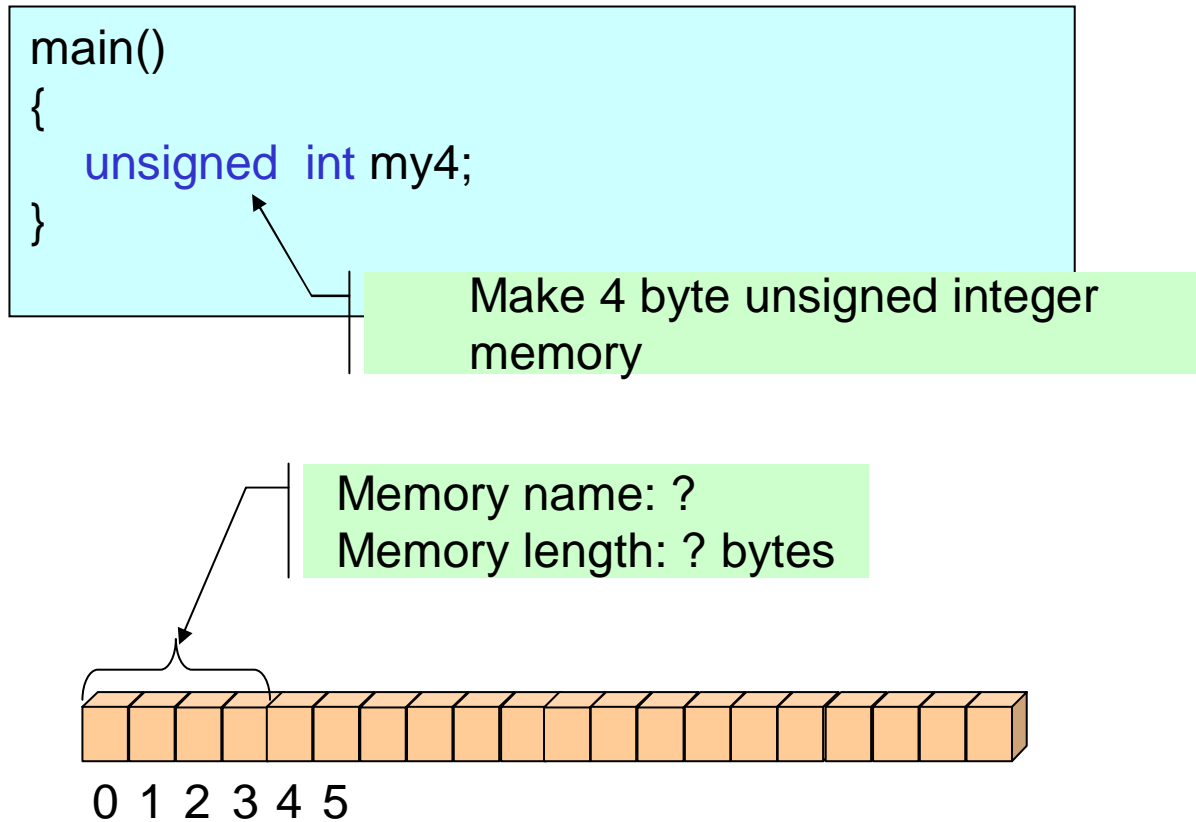


Understanding Memories (Variables)

- How to use memory in C-language
- Declaration in C-language



Understanding Memories (Variables)



Understanding Memories (Variables)

- Reserved words to create memories for integer number

Reserved word	Meaning	Note
{ signed } char	create 1 byte integer	signed
{ signed } short	create 2 byte integer	signed
{ signed } int	create 2 or 4 byte integer	signed
{ signed } long	create 4 byte integer	signed
unsigned char	create 1 byte integer	unsigned
unsigned short	create 2 byte integer	unsigned
unsigned int	create 2 or 4 byte integer	unsigned
unsigned long	create 4 byte integer	unsigned

Understanding Memories (Variables)

- Differences between signed and unsigned

Human uses
the decimal system

123 ₍₁₀₎
123 ₍₁₀₎

Memory uses
the binary system

01111011 ₍₂₎ 8 bit
0000000001111011 ₍₂₎ 16bit

How to represent the signed integer number ?

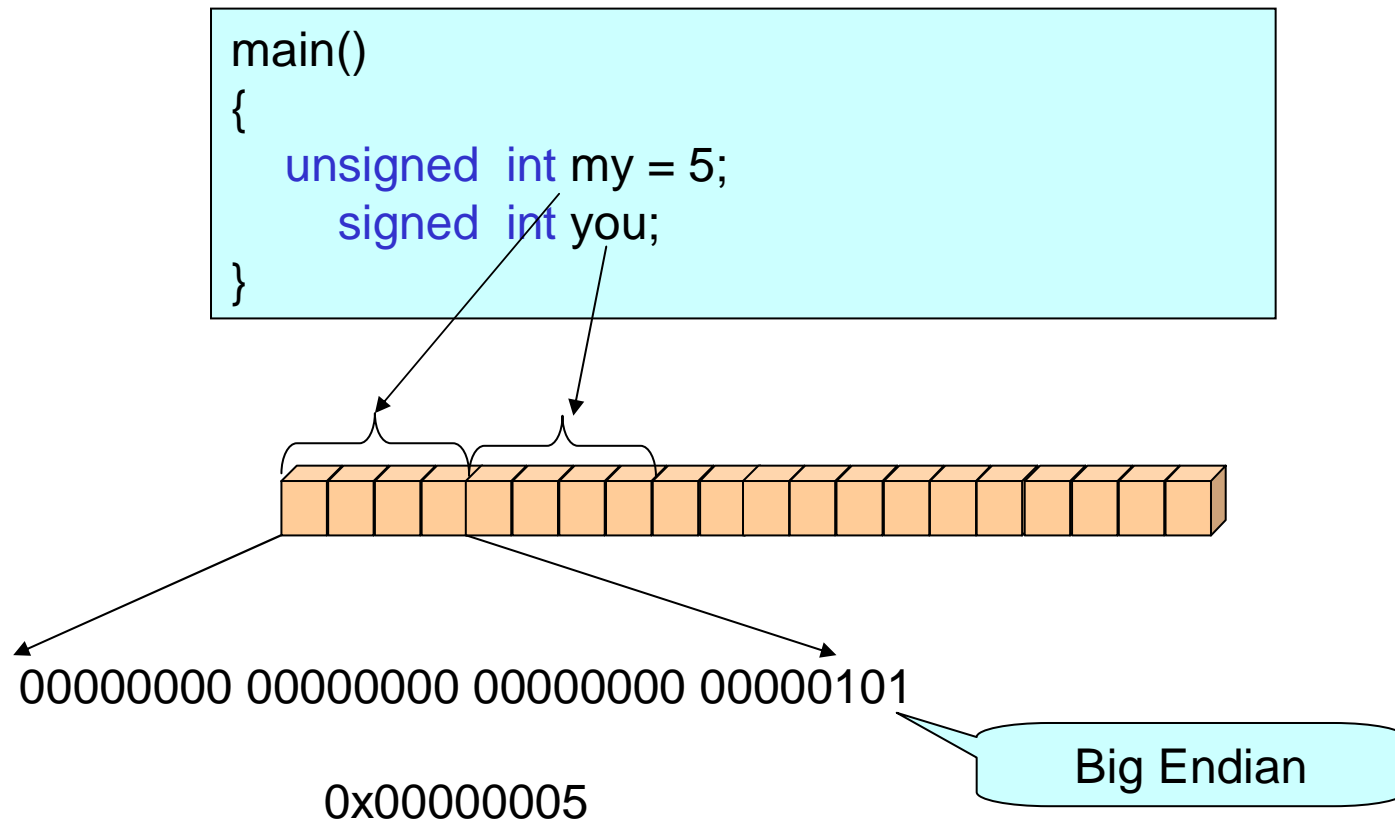
-123 ₍₁₀₎	→	???????? ₍₂₎
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Understanding Memories (Variables)

- signed and unsigned integer

unsigne	binary	signed
0 ₍₁₀₎	00000000 ₍₂₎	0 ₍₁₀₎
1 ₍₁₀₎	00000001 ₍₂₎	1 ₍₁₀₎
⋮	⋮	⋮
127 ₍₁₀₎	01111111 ₍₂₎	127 ₍₁₀₎
128 ₍₁₀₎	10000000 ₍₂₎	-128 ₍₁₀₎
⋮	⋮	⋮
254 ₍₁₀₎	11111110 ₍₂₎	-2 ₍₁₀₎
255 ₍₁₀₎	11111111 ₍₂₎	-1 ₍₁₀₎

Understanding Memories (Variables)



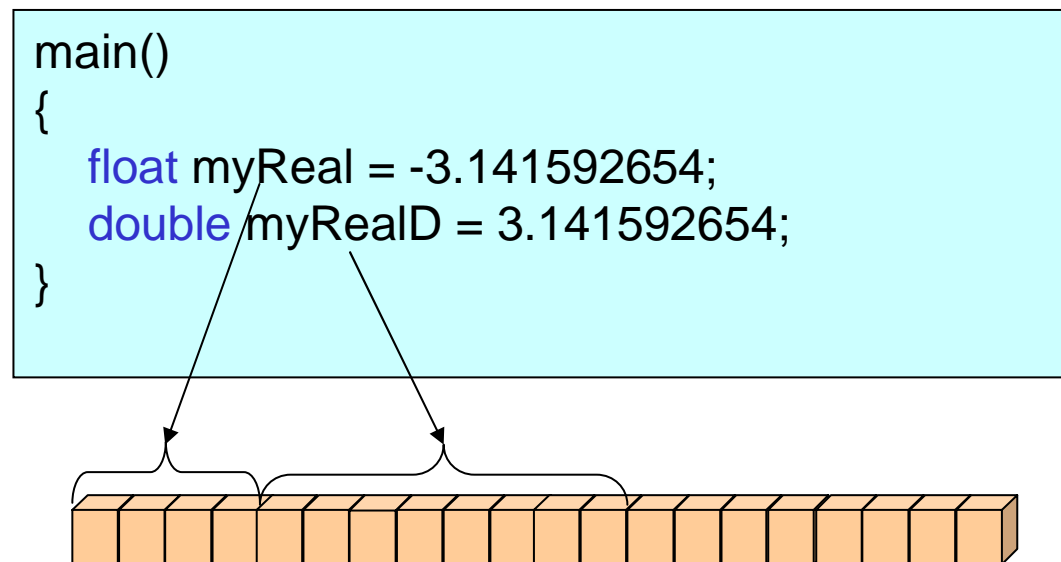
Understanding Memories (Variables)

- Reserved words to create memories for float pointing number

Reserved word	Meaning	Note
float	create 4 byte real	signed
double	create 8 byte real	signed

Understanding Memories (Variables)

- Example of making floating-point memories



Summary

- The basic memory in C-language is called “variable”
- Memory Map
- Types of variables
 - Integer
 - Real
- To make variables (memories), we use

{ signed } char	unsigned char	float
{ signed } short	unsigned short	double
{ signed } int	unsigned int	
{ signed } long	unsigned long	