

# **Lecture++: Review**

**10/29/2012**

# About Midterm Exam

- Hold on 11/05
- Few programming exercises at the class
- Have only web access to the course slides
- Bring other documents is not allowed

# Data Type

- int
- unsigned int
- long long int
- float
- double
- long double
- char

# Input and Output

- Format
  - %d, %lld, %u, %llu, %f, %lf, %c, %s
- `scanf(format, &arg1, &arg2, ...);`
- `printf(format, arg1, arg2, ...);`
- `gets(string);`
- `puts(string);`
- `getchar();`
- `putchar(char);`

# Control Flow

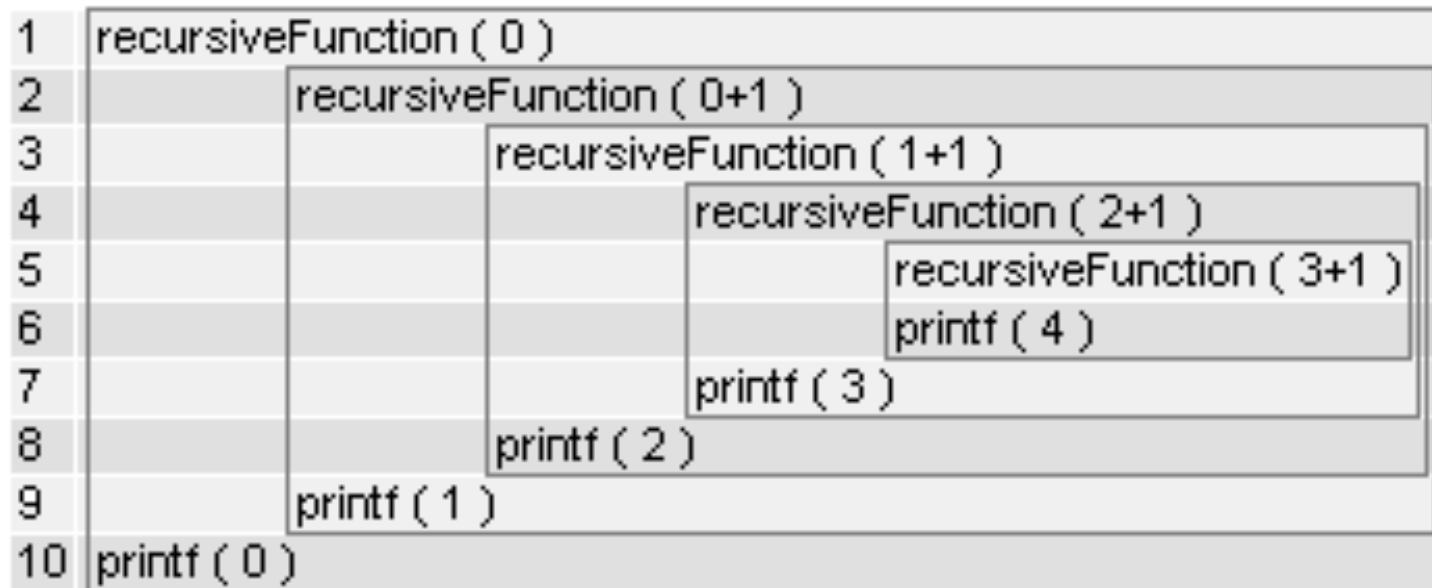
- Condition
  - &&, ||, !, ==, !=, >, <, >=, <=
- if, else if, else
- switch, case, default
- for(<exp1>;<condition>;<exp2>){<statement>}
- while(<condition>){<statement>}
- do{<statement>}while(<condition>)
- break, continue

# Function

- Function name
- List of parameters
- Statement
- Return type

# Recursion

- A function is recursive if it calls itself.



# Array

- `<Type> array_name[<Size>;`
- Collection of same type elements
- Constant size
- Zero-based
- Multidimensional array
  - `int multi_array[n][m];`

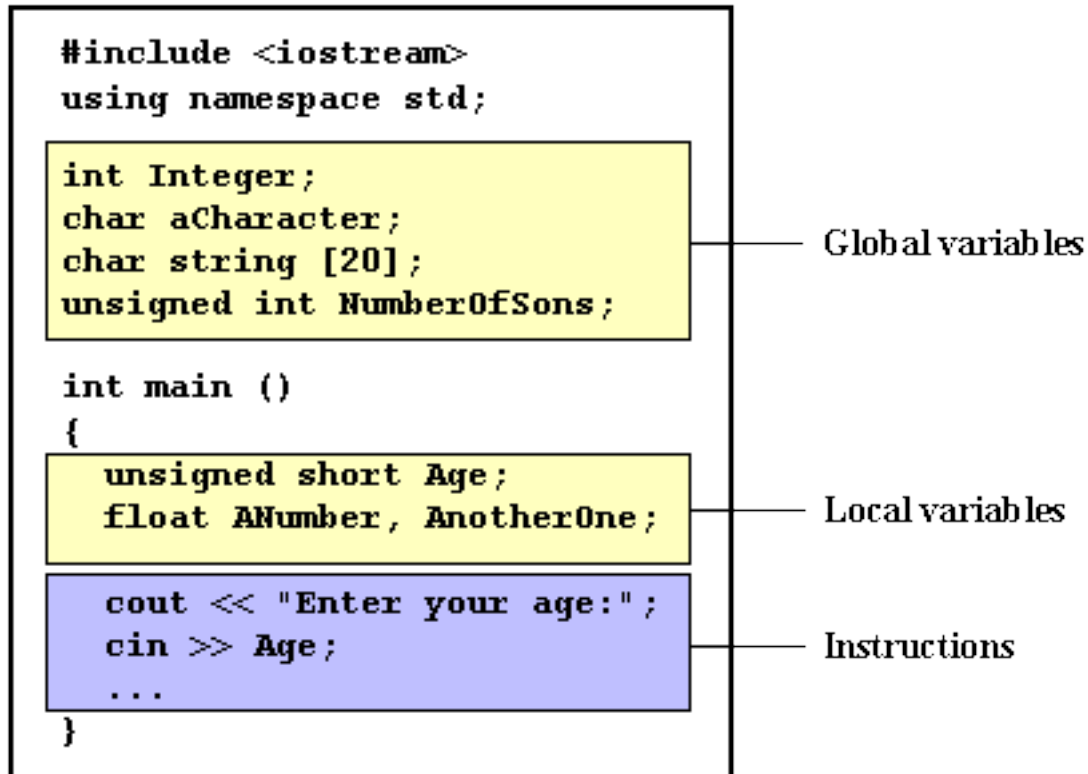


# Pointer

- Declaration
- Addressing operator (&)
- Dereferencing operator (\*)
- Pointers and arrays are closely related
  - $a[0]$  is the same as  $*a$
  - $a[1]$  is the same as  $*(a + 1)$

# Variable Scope

- Global variable
- Local variable



# Memory

- Heap
- Stack
- malloc(size)
- free(address)

# Common Bugs - Typo

- `scanf("%d", n);`
- `char s[10]; scanf("%c", s);`
- `char c="a";`
- `if(a=1)`
- `if(0<a<10)`
- `if(a==b & b==c)`
- `for(i=1;1<=n;i++)`
- `while(i<10); i++;`

# Common Bugs - Memory

- Index range of array[n] is from 0 to n-1
- Use pointer without malloc()
- Forgetting '\0' in the end of string
- Calling free() for the same address twice
- Query a huge size of memory

# Common Bugs - Others

- Misunderstanding the problem
- Uninitialized variable
- Exceeding the range of int
- Zero division
- Forgetting to put a break in a switch
- Comparing strings with “==”