



CMSC 106 Lecture Set #7

Set Started:
Tuesday, October 9, 2007



- **Function definition**
 - Gives a name to a group of statements which can then be executed (called) just using that name.
- **Mathematical functions**

$$\begin{array}{c} \sin(x) = y \\ \uparrow \quad \uparrow \quad \uparrow \\ | \quad | \quad | \\ | \quad | \quad | \\ | \quad | \quad | \\ | \quad | \quad | \\ \text{+-- argument} \\ \text{+-- function name} \end{array}$$

function's result
- In C, function result is called return value.



Defining a function

- **Functions must be defined to be used.**
 - Definition gives
 - **type of its return value**
 - **function's name** (same rules as variable names)
 - **names and types of its parameters**
 - its **statements** (or body)
- ```
ftype fname(parameterlist)
{
 body of function
}
```
- **If type omitted** an int type is assumed.
  - **If no return type is desired** the term **void** should be used.
  - **If parameter list is empty** the term **void** should be used.
  - **The body** should have a **return** statement where the type matches the return type specified.
  - **The fname** must be unique.
  - **A function can NOT be defined inside another one.**

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## Simple example function definition:

```
void error_msg(void) {
 printf("This ");
 printf("is Bad Input\n");
 return;
}
```

- function **name** = "error\_msg"
- **return type** = nothing
- **list of parameters** = empty
- **body** has only three statements

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## Calling (executing) a function:

- general form:
  - **function-name(any arguments)**
- as a statement:
  - **printf("Hello,");**
- or as an expression in assignment:
  - **ch = getchar();**
- or as an expression being tested in a condition:
  - **while (!feof(stdin))**

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## Example using a function

```
#include <stdio.h>

void error_msg(void) {
 printf("This ");
 printf("is Bad Input\n");
 return;
}

main() {
 int day1, day2;
 printf("type in two dates:");
 scanf("%d%d", &day1, &day2);
 printf("\ntest of first\n");
 if (day1 > 31)
 error_msg();
 if (day1 <= 0)
 error_msg();
 printf("\ntest of second\n");
 if (day2 > 31)
 error_msg();
 if (day2 <= 0)
 error_msg();
 return 0;
}
```

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## Examples

- parameter passing example
- return value example
- function calling function example

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