



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**

$\sin(x) = y$

^ ^ ^

| | |

| | function's result

| |

| +-- argument

|

+-- function name

- **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.**



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



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))**



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;
}
```



Examples

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