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)

\[
\text{ftype } \text{fname}(\text{parameterlist}) \\
\{ \\
\ \ \ \text{body of function} \\
\}
\]

- 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:

```c
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 = scanf("%d%d%d,&a,&b,&c);`

Examples

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