

Function input and output

- Functions are characterized in terms of:
 - Input (data that must be passed in to the function)
 - Output (data the function passes back to the caller)
 - Side-effects (other changes, like printing or waiting for user input)
- Data can only be stored in three types of variables:
 - Value parameters
 - Reference parameters
 - Local variables

Function input and output

- Parameters support input
 - Only reference parameters also support output
 - Local variables can not be used for input
 - A single parameter or variable can be output with `return`
- Data requirements dictate parameters
 - Input only: value parameter
 - Output only:
 - Local variable and `return` (if only 1 output)
 - Reference parameter (if more than 1)
 - Input and output: reference parameter

Exercise

- Consider the following function body
 - Write an appropriate heading for this function
 - Choose any name you like for the function
 - What parameters? Reference or value?
 - (Assume a, b and c are all *int*)

```
{  
    c = (a * b) / 2;  
    if( a > b )  
    {  
        b = 17;  
    }  
    else  
    {  
        b = 20;  
    }  
}
```

Example: Largest and Smallest

1. Get any number of numbers from the user
 - Stop when the user types in -1
2. Print the largest and smallest of those numbers

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- How would you do it?
 - Imagine a deck of cards with numbers on them
 - How would you find the largest and smallest numbers in the deck?

Example: Largest and Smallest

1. Get any number of numbers from the user
 - Stop when the user types in -1
 2. Print the largest and smallest of those numbers
- Now make step 1 a function
 - What are the input parameters?
 - What are the values you want to output?
 - Return can only return a single value
 - Use reference parameters to output more than one value