Function Examples

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These slides provide a couple of C function examples

Functions Examples

- Single File Program Structure

Includes

Function Declarations

```
void main(void){
    ...
    foo = fun1(a, b);
    fun2(2, c);
    if(fun1(c, d)) {
        ...
    }
}
```

Function 1 Definition

Function 2 Definition

Functions Examples

- User Defined Functions – example 1

declaration

```
float vol(float length, float width, float height);
```

```
int main(void){
  float volume;
  float W;
  float L;
  float H;
  // enter W, L, H
  ...
  volume = vol(L, W, H);
  ...
  return 0;
}// end main
```

call

Actual Parameters

Formal Parameters

values passed -
not the variables

W=5
L=3
H=2

volume = vol(3,5,2);

volume = 30

definition

```
// proper description – see following slides
float vol(float length, float width, float height){
  float tmp_val;
  tmp_val = length * width * height;
  return tmp_val;
}// end vol
```

length = 3
width = 5
height = 2

return 30

Functions Examples

- Example
  - inputs and return value

```
/*
 * functions_examples.c
 *
 *  Created on: Dec 4, 2019
 *      Author: johnsontimoj
 */
//////////////////////////////////
//
// Example functions for class notes
//
// inputs: function dependent
// outputs: function dependent
//
//////////////////////////////////////
#include <stdio.h>

// function declarations
int bigger(int val1, int val2);

int main(void){
    setbuf(stdout, NULL);   // disable buffering

    //  Local variables
    int x;
    int y;
    int z;

    while(1){
        //   Get inputs
        printf("Please enter a values for x and y: ");
        scanf("%i %i", &x, &y);

        // determine bigger value
        z = bigger(x, y);

        //   print the value
        printf("The bigger value is: %i\n\n", z);
    }// end while

    return 0;
} // end main
```

```
////////////////////////////////////
// bigger()
//
// function to return the larger of two integers
// result is available for further processing
//
// inputs: 2 ints
// output: larger int
////////////////////////////////////
int bigger(int val1, int val2){
    int big_val;
    if(val1 > val2)
        big_val = val1;
    else
        big_val = val2;

    return big_val;
}// end bigger()
```

Functions Examples

- Example
  - no inputs and no return value

```c
/*
 * functions_examples.c
 *
 *  Created on: Dec 4, 2019
 *      Author: johnsontimoj
 */
/////////////////////////////////
//
// Example functions for class notes
//
// inputs: function dependent
// outputs: function dependent
//
/////////////////////////////////
#include <stdio.h>

// function declarations
void smaller(void);

int main(void){
    setbuf(stdout, NULL);  // disable buffering

    //  Local variables

    while(1){

        smaller();

    }// end while

    return 0;
} // end main
```

```c
/////////////////////////////////
// smaller()
//
// function to return the smaller of two integers
// result is not available after the print   <----
//
// inputs: 2 ints
// output: smaller int
/////////////////////////////////
void smaller(void){
    int x;
    int y;
    int z;

    //   Get inputs
    printf("Please enter a values for x and y: ");
    scanf("%i %i", &x, &y);

    if(x < y)
        z = x;
    else
        z = y;

    //   print the value
    printf("The smaller value is: %i\n\n", z);

    return;
}// end smaller()
```

Functions Examples

- Example
  - no inputs and return value

```c
/*
 * functions_examples.c
 *
 *  Created on: Dec 4, 2019
 *      Author: johnsontimoj
 */
/////////////////////////////////
//
// Example functions for class notes
//
// inputs: function dependent
// outputs: function dependent
//
/////////////////////////////////
#include <stdio.h>

// function declarations
char get_cap(void);

int main(void){
    setbuf(stdout, NULL);   // disable buffering

    //  Local variables
    char the_cap;

    while(1){

        the_cap = get_cap();

        printf("The capital of the letter entered is: %c\n\n", the_cap);

    }// end while

    return 0;
} // end main
```

```c
/////////////////////////////////
// get_cap()
//
// function to read in a letter and capitalize it
// result is available after the print    <-----
//
// inputs: char (letter)
// output: capital version of the letter, or 0 if invalid input
/////////////////////////////////
char get_cap(void){
    char letter;

    //   Get inputs
    printf("Please enter letter: ");
    scanf(" %c", &letter);

    if((letter >= 'a') && (letter <= 'z')){
        letter -= 0x20;
    }else{
        if(!((letter >= 'A') && (letter <= 'Z')))    // check if not a cap
            letter = '0';
        // no else needed - already a capital letter
    }

    return letter;
}// end get_cap()
```

Functions Examples

- Example
  - inputs and no return value

```c
/*
 * functions_examples.c
 *
 *   Created on: Dec 4, 2019
 *       Author: johnsontimoj
 */
/////////////////////////////////
//
// Example functions for class notes
//
// inputs: function dependent
// outputs: function dependent
//
/////////////////////////////////////
#include <stdio.h>

// function declarations
void print_cap(char the_letter);

int main(void){
    setbuf(stdout, NULL);  // disable buffering

    //  Local variables
    char letter;

    while(1){
        //   Get inputs
        printf("Please enter letter: ");
        scanf(" %c", &letter);

        print_cap(letter);

    }// end while

    return 0;
} // end main
```

```c
/////////////////////////////////
// print_cap()
//
// function to capitalize a letter and print it
// original letter is available after the print
//
// inputs: char (the_letter)
// output: print capital version of the letter, or 0 if invalid input
/////////////////////////////////
void print_cap(char the_letter){

    if((the_letter >= 'a') && (the_letter <= 'z')){
        the_letter -= 0x20;
    }else{
        if(!((the_letter >= 'A') && (the_letter <= 'Z')))   // check if not a cap
            the_letter = '0';
        // no else needed - already a capital letter
    }

    printf("The letter capitalized is: %c\n\n", the_letter);

    return ;
}// end print_cap()
```