

Methods (cont.)

Chapter 7

Defining Simple Methods

```
ReturnType Identifier ( ParameterList ) {  
    Body  
}
```

- `ReturnType` is the type of value returned from the method/function.
- `Identifier` is the name of the method/function.
- `ParameterList` is a list of variables that will be used to pass information into the method. These are called the formal parameters.
- `Body` is a list of statements and declarations describing the action performed by this method.

A familiar example

```
int x = max(mouseX, mouseY);
```

- The return type in this function-call is int

```
int constrainIt(int val, int min, int max) {
    if (val < min)
        return min;
    else if (val > max)
        return max;
    else
        return val;
}

int power(int x, int exponent) {
    int result = 1;
    while (exponent > 0) {
        result = result * x;
        exponent--;
    }
    return result;
}
```

```
int constrainIt(int val, int min, int max) {
    if (val < min)
        return min;
    else if (val > max)
        return max;
    println("test");
    return val;
}

void setup() {
    println(constrainIt(10, 20, 30));
    println(constrainIt(25, 20, 30));
    println(constrainIt(40, 20, 30));
}
```

What is the SECOND line of output from this program?

- A. 10
- B. 20
- C. test
- D. 25

```
// what does this print?  
void setup() {  
    println(sqrt(area(max(10, 20), 5)));  
}  
  
int area(int width, int length) {  
    return width*length;  
}
```

```
void setup() {  
    func1(func2(func3(10)));  
}  
  
void func1(int x) {  
    println("func1 " + x);  
}  
  
int func2(int x) {  
    println("func2 " +x);  
    return func3(2*x);  
}  
  
int func3(int x) {  
    println("func3 " + x);  
    return x*10;  
}
```

What is the first word to be output?

- A. func1
- B. func2
- C. func3

```
void setup() {  
    func1(func2(func3(10)));  
}  
  
void func1(int x) {  
    println("func1 " + x);  
}  
  
int func2(int x) {  
    println("func2 " +x);  
    return func3(2*x);  
}  
  
int func3(int x) {  
    println("func3 " + x);  
    return x*10;  
}
```

What is the last number printed?

- A. 10
- B. 100
- C. 200
- D. 2000

Write a program that displays three buttons evenly spaced along the top of the display, labeled "one", "two", "three". If the mouse is clicked on one of the "buttons" have it change its appearance while the mouse is pressed, and print some message specific to the button when the mouse is released.

```
/*  
Draw a button with a label.  
*/  
void drawButton(String label, int x, int y, int width,  
                int height, boolean pressed)  
{  
    if (pressed) {  

```

```
/*
```

Draws a row of three labeled buttons across the top of the display.

Uses the global `buttonSelected` to control how buttons are displayed.

```
*/
```

```
void drawButtons() {  
    drawButton("one", 0, 0,  
               buttonWidth, buttonHeight, buttonSelected==1);  
    drawButton("two", buttonWidth, 0,  
               buttonWidth, buttonHeight, buttonSelected==2);  
    drawButton("three", 2*buttonWidth, 0,  
               buttonWidth, buttonHeight, buttonSelected==3);  
}
```

```
// This assumes there are 3 buttons evenly spaced along
// the top of the display, each being buttonWidth wide and
// buttonHeight high.
void mousePressed() {
    buttonSelected = 0; // clears any prior selection
    if ( mouseY < buttonHeight ) {
        if ( mouseX < buttonWidth ) {
            buttonSelected = 1;
        }
        else if ( mouseX < 2*buttonWidth ) {
            buttonSelected = 2;
        }
        else {
            buttonSelected = 3;
        }
    }
    drawButtons();
}
```

```
/*  
Respond to some button click.  
*/  
void mouseReleased() {  
    if (buttonSelected == 1 ) {  
        println("one");  
    }  

```

What does this program print?

```
void setup() {  
    println(mystery(10,20,30));  
    println(mystery(20,30,10));  
    println(mystery(30,20,10));  
}  
boolean mystery (int x, int y, int z) {  
    return x <= y && y <= z;  
}
```

- A. true, true, false
- B. true, false, false
- C. false, false, true
- D. false, true, true
- E. false, false, false

Do these two functions always return the same value?

A. Yes B. No

```
int try1(int x, int y, int z) {  
    return min(x, min(y, z));  
}  
  
int try2(int x, int y, int z) {  
    if (x <= y && x <= z)  
        return x;  
    else if (y <= x && y <= z)  
        return y;  
    else  
        return z;  
}
```

Write a method that takes one integer, size, and fills the display with size by size squares in outline form (i.e. no fill but black outline).


```
/* Program that implements a method fillDisplay, such
that it takes one integer, size, and fills the
display with size by size squares in outline form
(i.e. no fill but black outline).
*/

void setup(){
    size(300,300);
    fillDisplay(10);
}

void fillDisplay(int size){
    for(int i = 0; i < width/size;i++){
        for(int j = 0;j < height/size;j++){
            rect(j*size, i*size,size,size);
        }
    }
}
```

Write a function `inBox()` that takes 6 parameters. The first two are the coordinates of a point. The last four are the standard parameters for specifying a rectangle to the function `rect()`. Return `true` if the point is within the rectangle or on the boundary and return `false` otherwise.

```
// Program to determine if a point is inside of a rect
void setup(){
    println(inBox(5,5,0,0,10,10));
}
boolean inBox(int px, int py, int x, int y, int wid, int
hei){
    return (px >= x && px <= (x + wid) && py >= y && py <=
(y + hei));
}
```

Modify ThreeButtons to allow for the three buttons to be anywhere, not just evenly spaced along the top.