Programming Fundamentals 1

Produced by

Mr. Dave Drohan (david.drohan@setu.ie)

Dr. Siobhán Drohan

Ms. Mairead Meagher

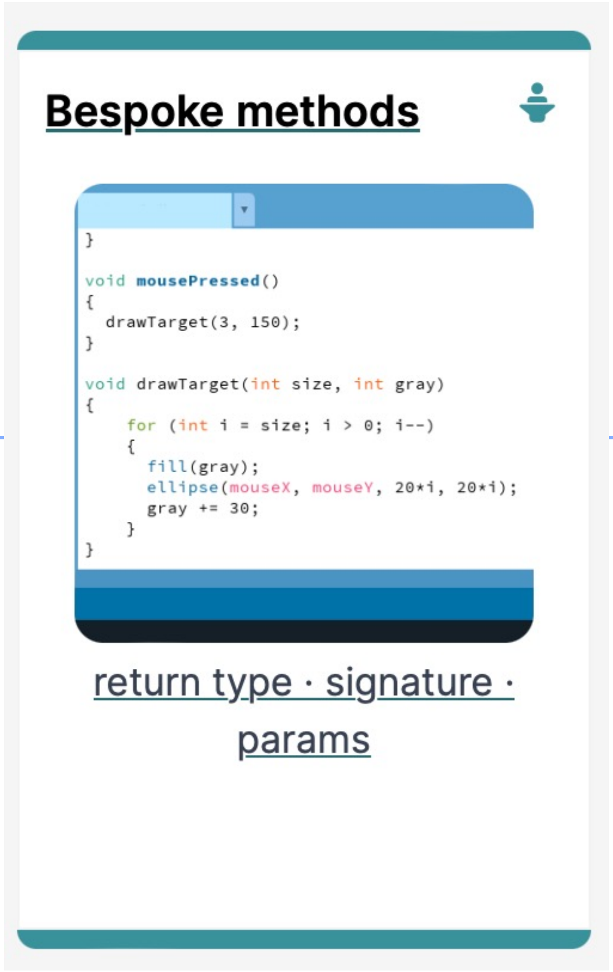
Department of Computing & Mathematics

South East Technological University

Waterford, Ireland

Introduction to Processing

Writing your own Methods



Bespoke methods

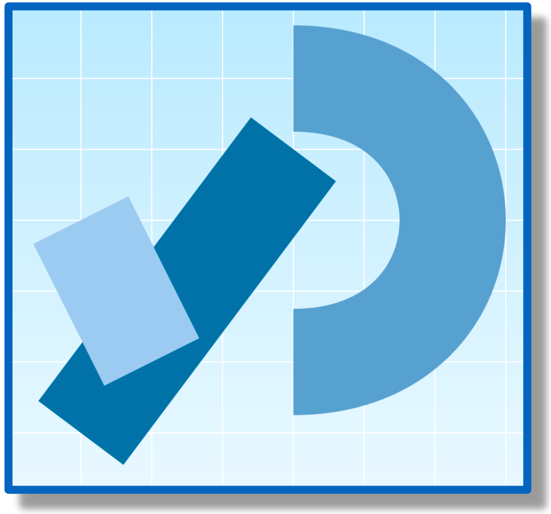
```
}

void mousePressed()
{
  drawTarget(3, 150);
}

void drawTarget(int size, int gray)
{
    for (int i = size; i > 0; i--)
    {
      fill(gray);
      ellipse(mouseX, mouseY, 20*i, 20*i);
      gray += 30;
    }
}
```

return type · signature · params

Agenda

- Recap Method terminology:
  - Return type
  - Method names
  - Parameter list
- **Writing your own** methods:
  - With no parameters
  - With parameters
  - That return data

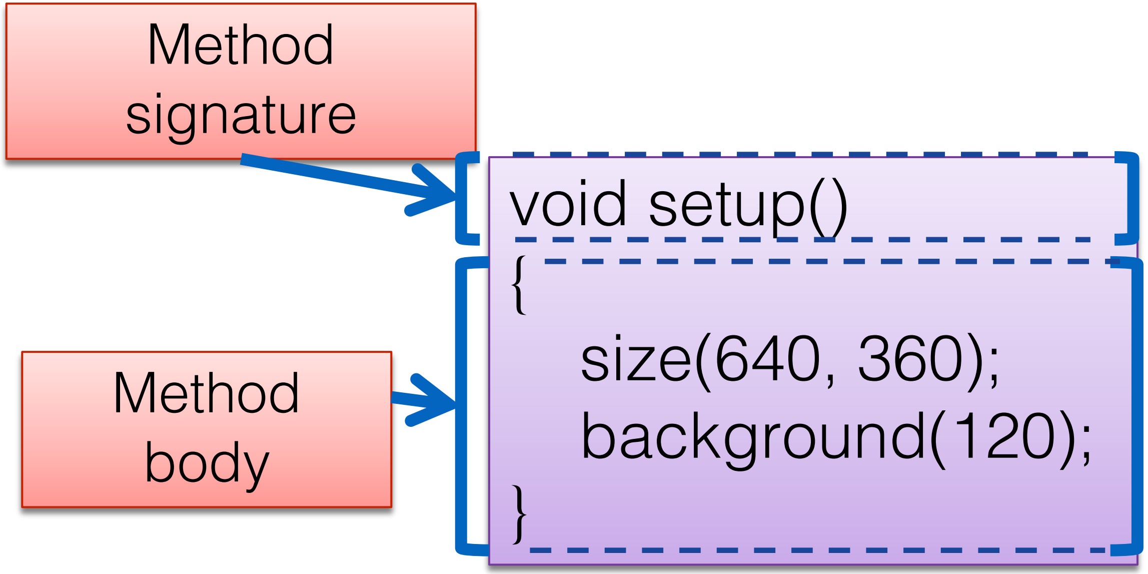
Recap : Method Terminology



Recap: Methods in Processing

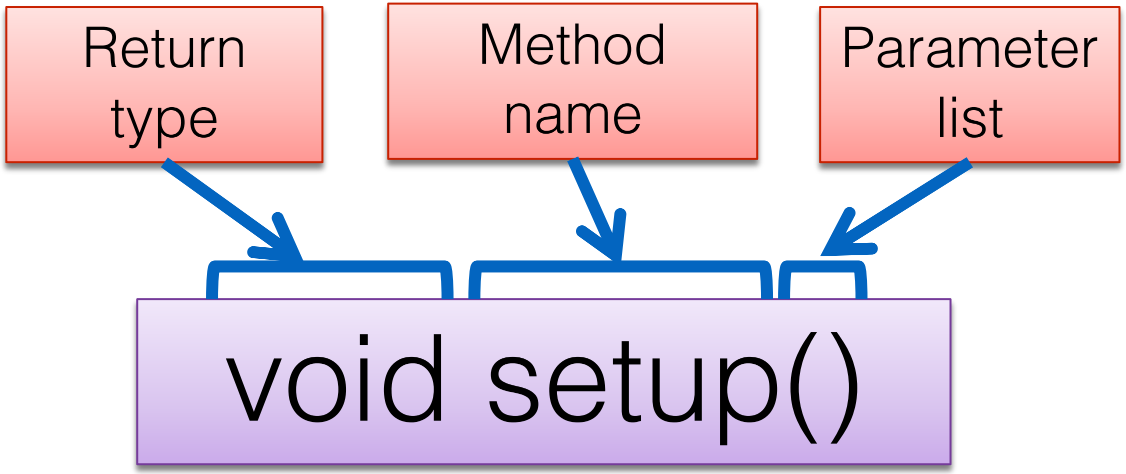
- A method comprises a **set of instructions that performs some task.**
- When we **invoke** the method,
  it performs the task.
- Some methods that we have used are:
  - rect, ellipse, stroke, line, fill, etc.
  - void mousePressed()
  - void setup, void draw()

Recap : Method terminology



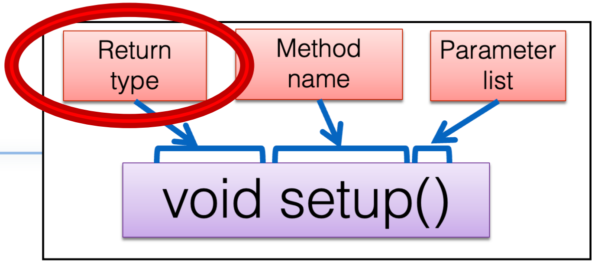
```
void setup()
{
    size(640, 360);
    background(120);
}
```

Recap : Method signature



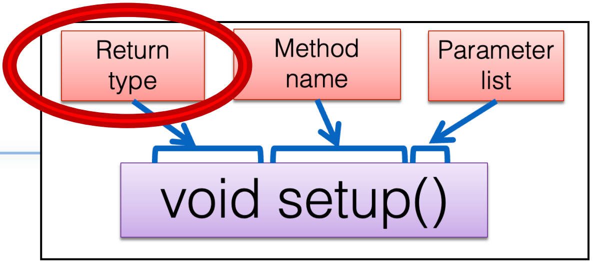
```
void setup()
```

Recap : Return Types



- Methods can **return information.**
- The void keyword means that **nothing** is returned from the method.
- When a **data type** (e.g. int) appears before the method name, this means that something is returned from the method.
- Within the body of the method, you use the return statement to return the value.
- You can **only have one return type per method.**
- Methods can return any type of data e.g. boolean, byte, char, int, float, String, etc.

Recap : Return Types



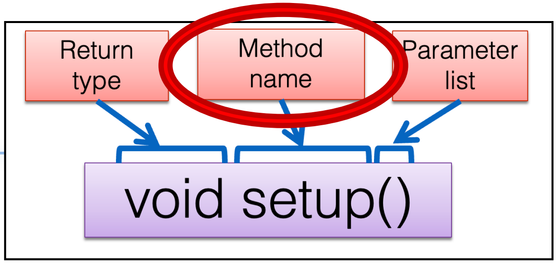
```
int val = 30;

void draw()
{
    int result = timestwo(val);
    println(result);
}
```

```
int timestwo(int number)
{
    number = number * 2;
    return number;
}
```

// The red int in the function declaration
// specifies the type of data to be returned.

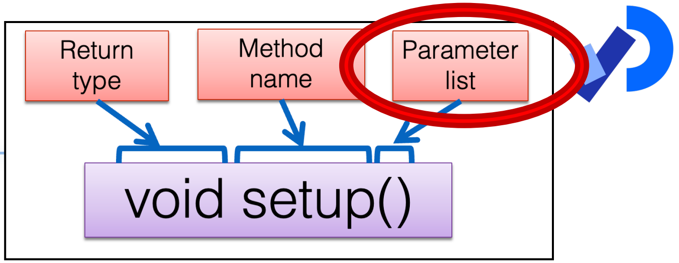
https://processing.org/reference/return.html

Recap : Method name



- Method names should:
  - Use **verbs** (i.e. actions)
    to describe what the method does e.g.
    - calculateTax
    - printResults
  - Be **mixed case (camelCase)** with the first letter lowercase and the first letter of each subsequent internal word capitalised.

Recap : Parameter list



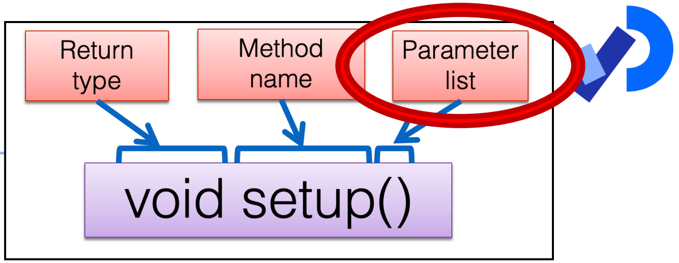
- Methods take in data via their **parameters.**

Methods do not have to pass parameters.

These methods don't need any additional information to do their tasks.

```
void noStroke()
void setup()
void noCursor()
```

Recap : Parameter list



- Methods take in data via their **parameters.**

Methods do not have to pass parameters.

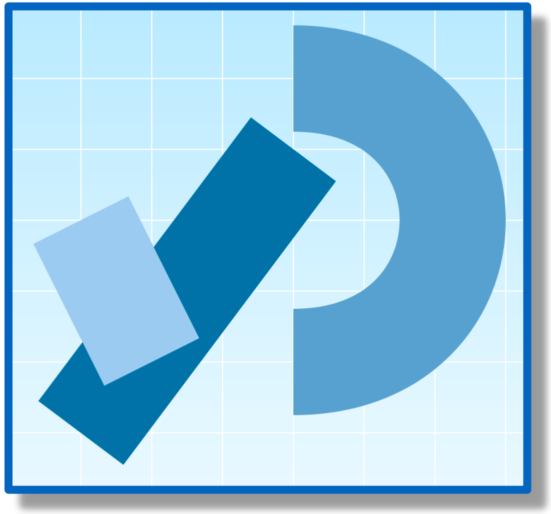
These methods don't need any additional information to do their tasks.

If a method needs additional information to execute, we provide a parameter so that the information can be passed into it.

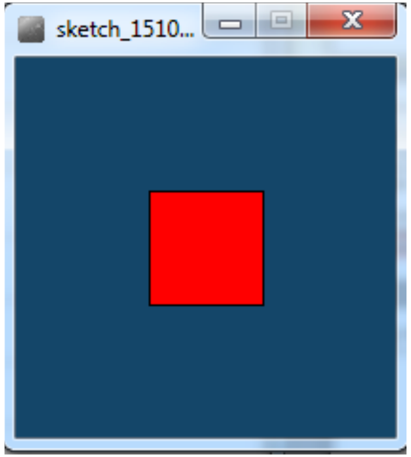
A method can have any number of parameters.

```
void strokeWeight (float weight)
void size (int width, int height)
```

Writing your own Methods

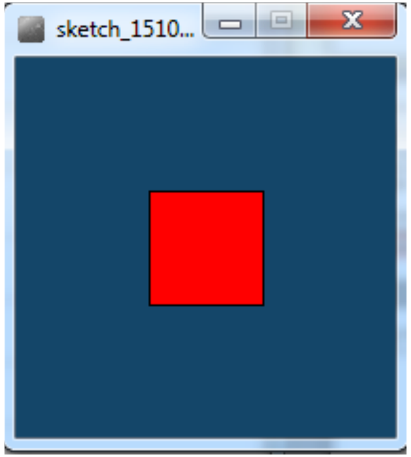


Writing methods with NO parameters



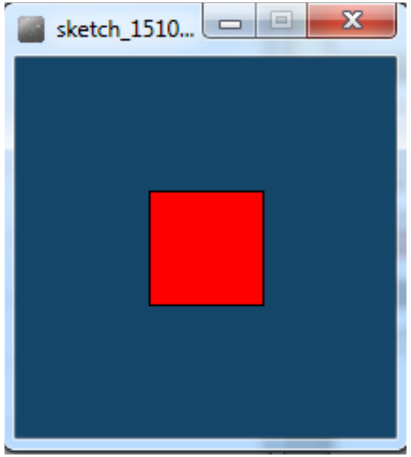
- ❑ Draw a red square at certain (x, y) coordinates.

Processing Example 5.2



```
void setup()
{
  size(200,200);
  background(20,70,105);
}

void draw()
{
  drawRedSquare();
}

void drawRedSquare()
{
  fill(255,0,0);
  rect(70,70,60,60);
}
```

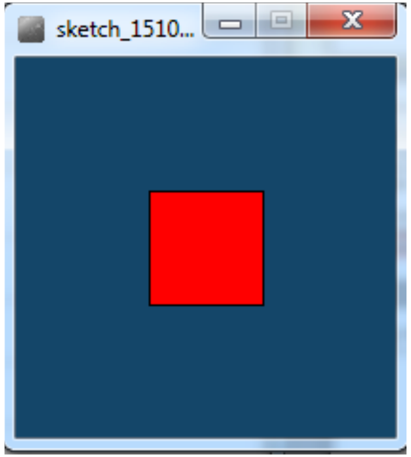
Writing methods with parameters



- ❑ Now update the code so that you can:

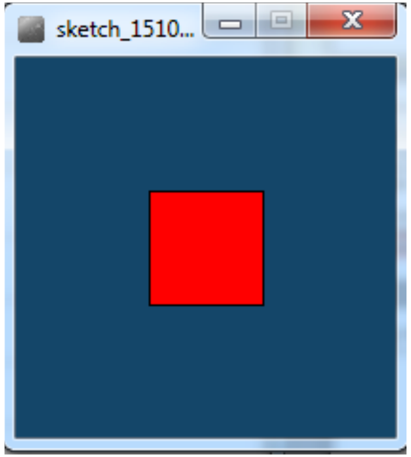
  pass in the length of the square into the method, `drawRedSquare`.

Processing Example 5.3



```
void setup()
{
  size(200,200);
  background(20,70,105);
}

void draw()
{
  drawRedSquare(60);
}

void drawRedSquare(int length)
{
  fill(255,0,0);
  rect(70,70,length, length);
}
```

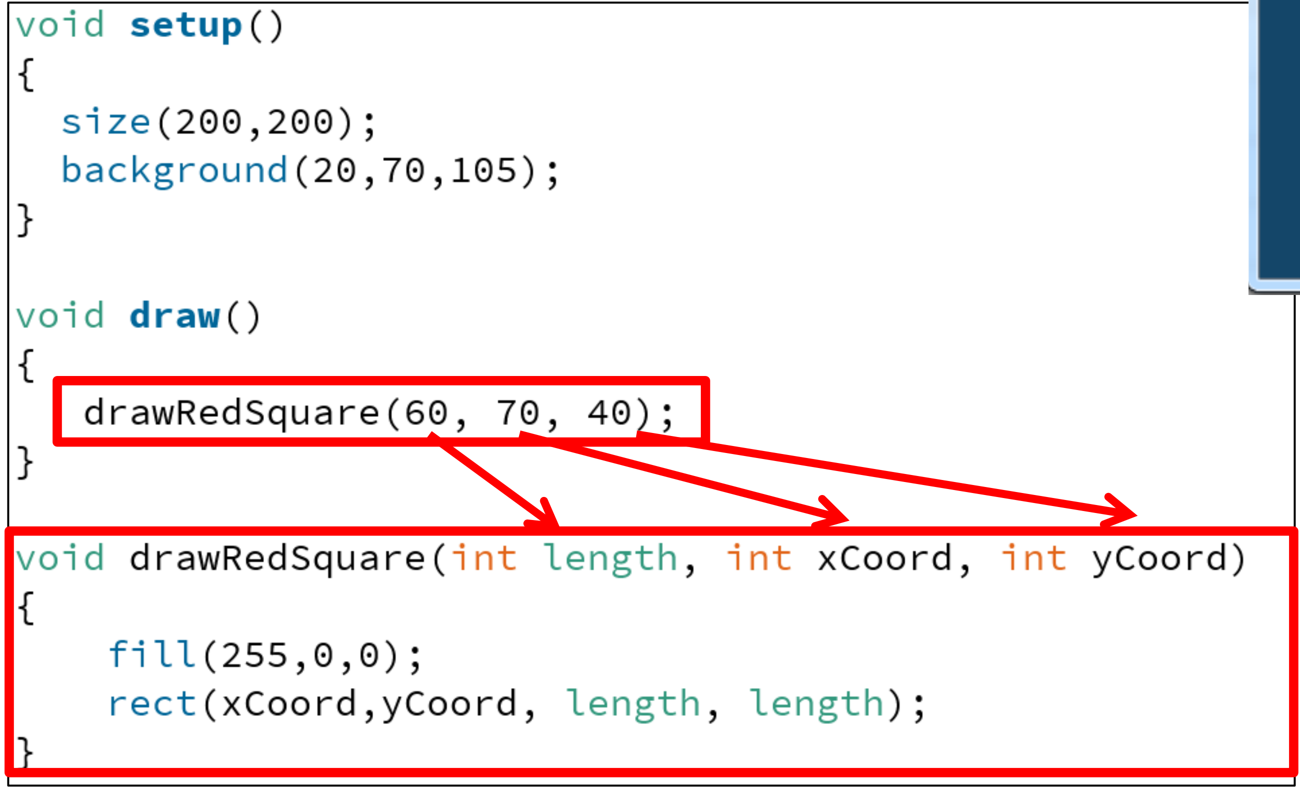
Writing methods **with parameters**



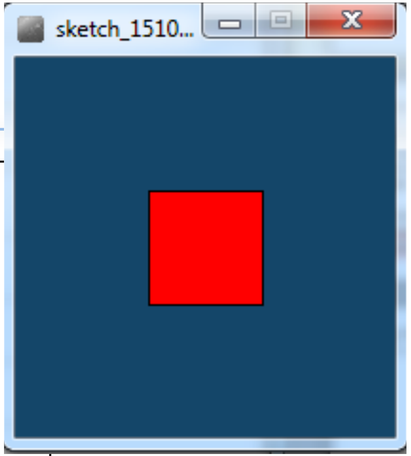
- Now update the code so that you can pass in the:
  - **length** of the square
  - **xCoordinate** of the square
  - **yCoordinate** of the square

into the method, `drawRedSquare`

Processing Example 5.4

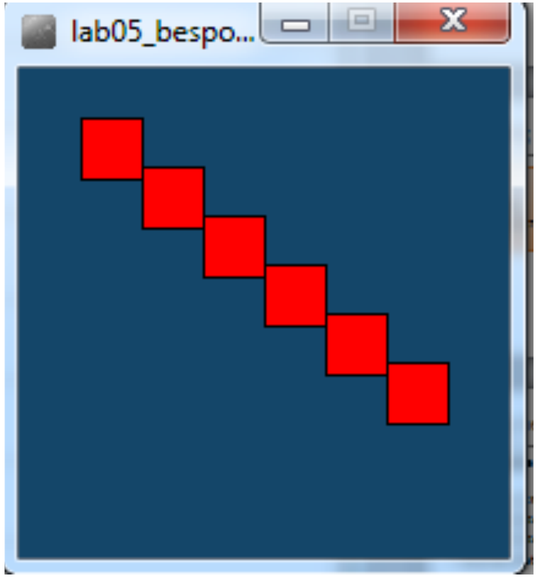


```
void setup()
{
  size(200,200);
  background(20,70,105);
}

void draw()
{
   drawRedSquare(60, 70, 40);
}

void drawRedSquare(int length, int xCoord, int yCoord)
{
    fill(255,0,0);
    rect(xCoord,yCoord, length, length);
}
```

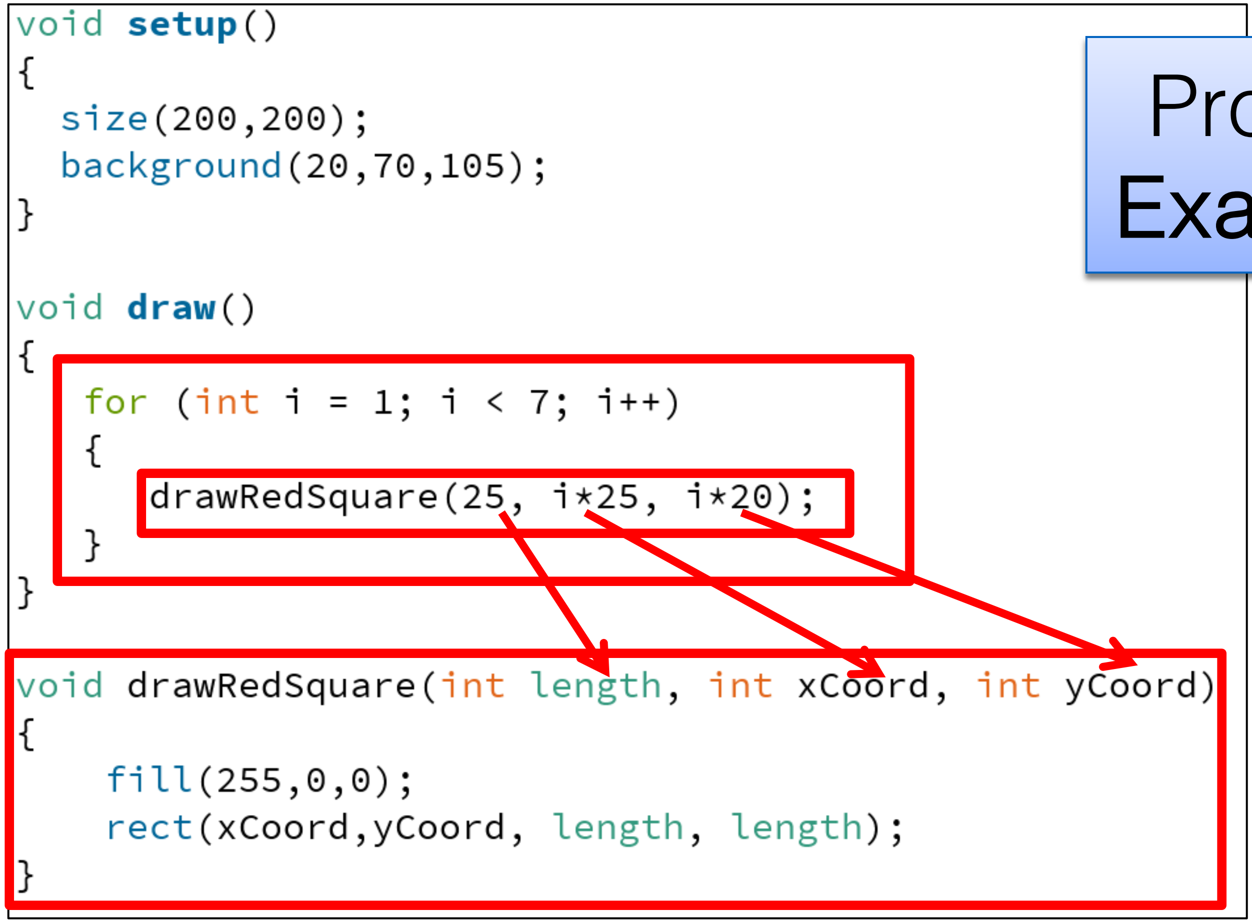


Writing methods with parameters

- Now update the code so that you can call the `drawRedSquare` multiple times (using a loop)



Processing Example 5.5

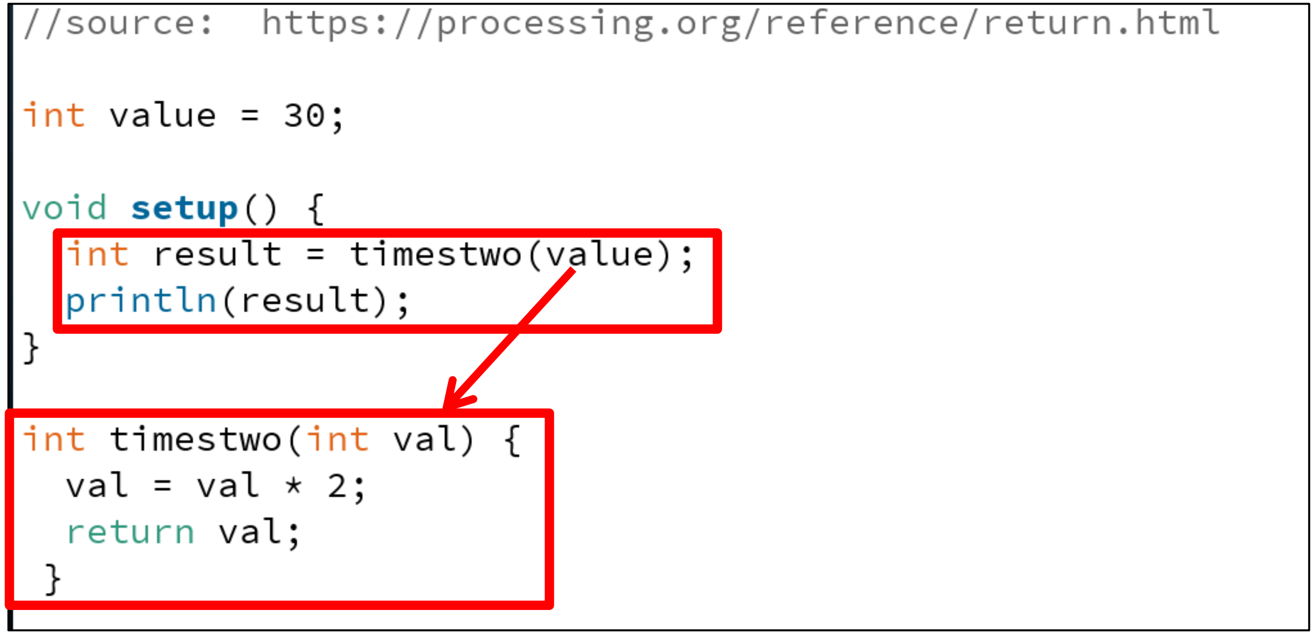


```
void setup()
{
  size(200,200);
  background(20,70,105);
}

void draw()
{
   for (int i = 1; i < 7; i++)
   {
      drawRedSquare(25, i*25, i*20);
   }
}

void drawRedSquare(int length, int xCoord, int yCoord)
{
    fill(255,0,0);
    rect(xCoord,yCoord, length, length);
}
```

Writing methods that return data

- Write a method called **`timesTwo`**
- This method should
  - take in one int parameter
  - multiply this int by 2 and
  - **return** it back to where the **`timesTwo`** method was called from
  - The returned value should be **printed to the console**

Processing Example 5.6



```
//source:  https://processing.org/reference/return.html

int value = 30;

void setup() {
  int result = timestwo(value);
  println(result);
}

int timestwo(int val) {
  val = val * 2;
  return val;
 }
```

Summary

1. Recap of method **terminology**:
   - Return type
   - Method names
   - Parameter list

2. **Writing your own** methods:
   - With no parameters
   - With parameters
   - That return data

Questions?

References

- Reas, C. & Fry, B. (2014) Processing – A Programming Handbook for Visual Designers and Artists, 2nd Edition, MIT Press, London.

Thanks.