Understanding Methods

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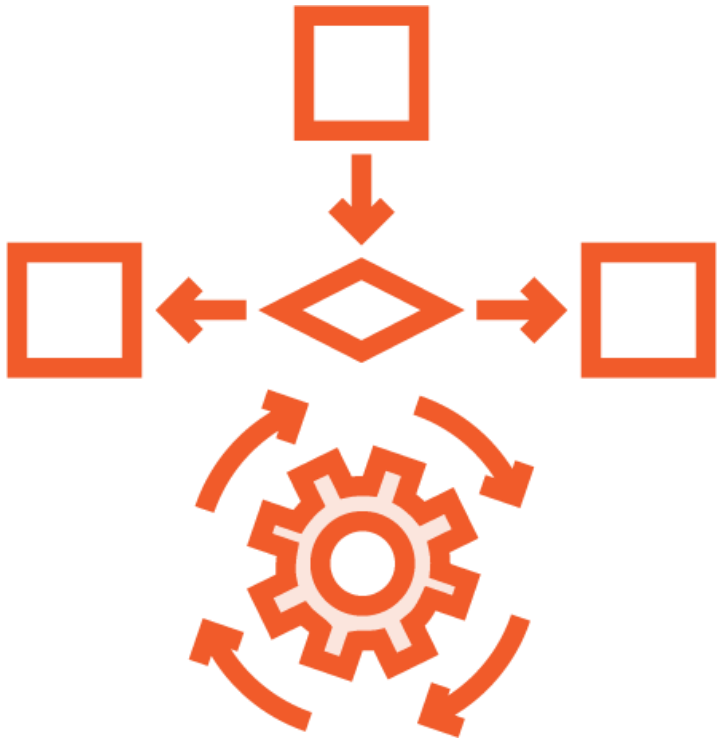
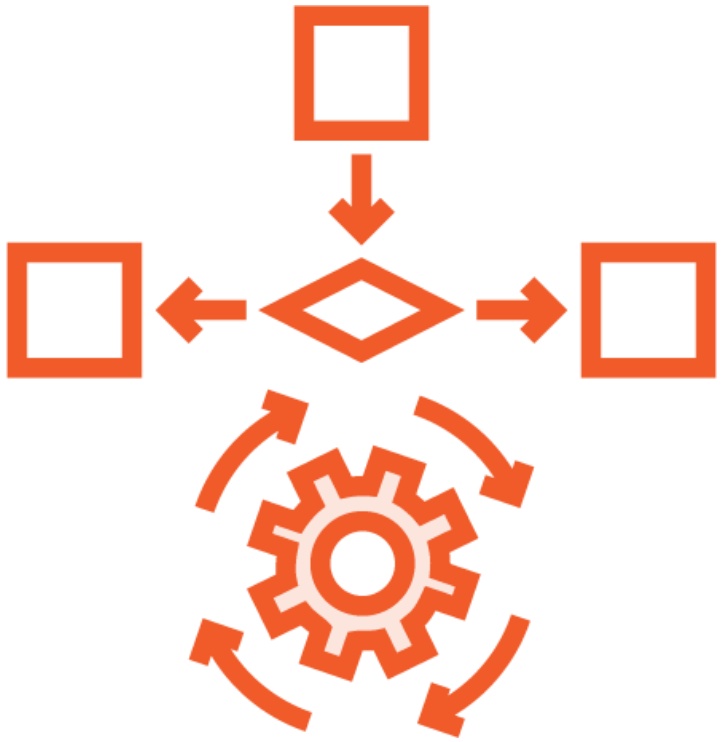
Overview

- Declaring and calling methods
- Parameters
- Exiting a method
- Returning a value
- Program command-line arguments



Method

- Mechanism for organizing code
- Enables creation of reusable code blocks
- Can receive data
- Can return data



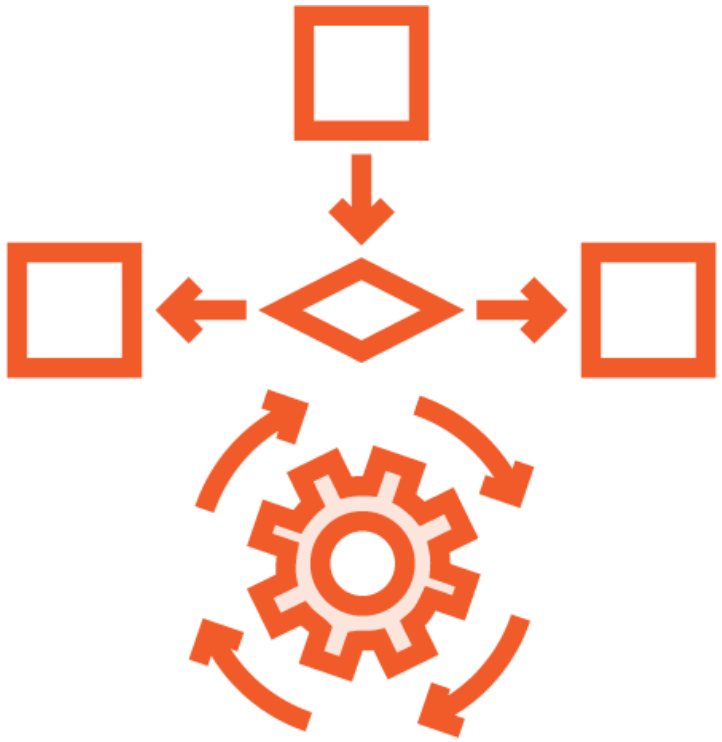
Name

- Same rules and conventions as variables

Typed parameter list

- Allow data values to be passed in
- Can be empty

```
name
```



Body

- Consists of zero or more statements
- Enclosed in brackets

Return type

- Indicates the type of data returned
- Use void when no value returned

```
                name (typed-parameter-list)
        statements
}
```

Using a Simple Method

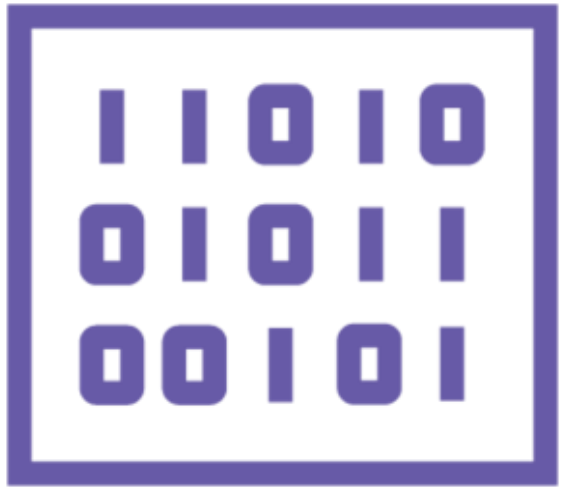
Main.java

```
System.out.println("Before method call");
doSomething();
System.out.println("After method call");

static void doSomething() {
    System.out.println("Inside method");
    System.out.println("Still inside");
}
```

```
Before method call
Inside method
Still inside
After method call
```

Method Data



Variables

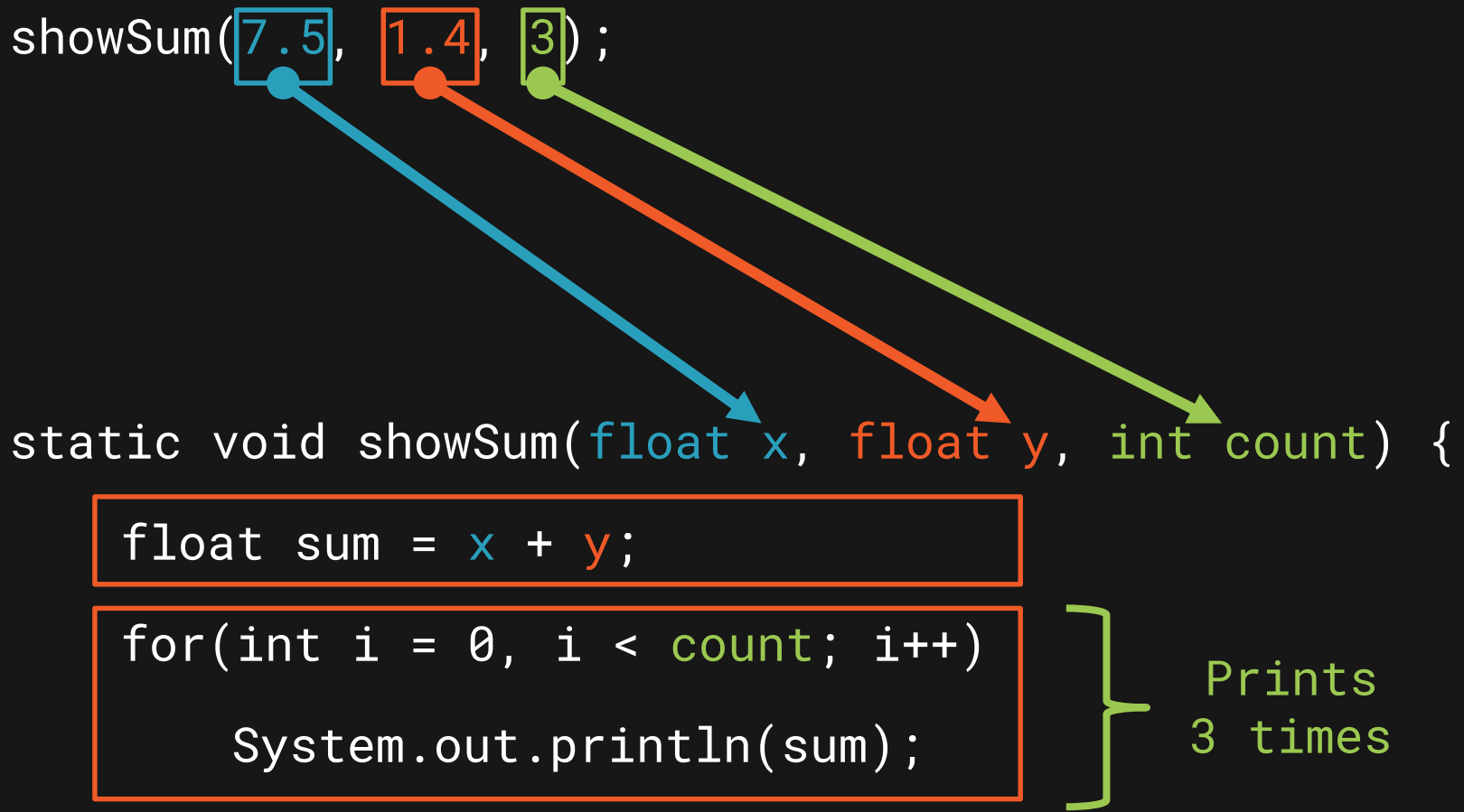
Scope limited to method where declared

Parameters

Enable passing data values to methods

Passed values matched to parameters by position

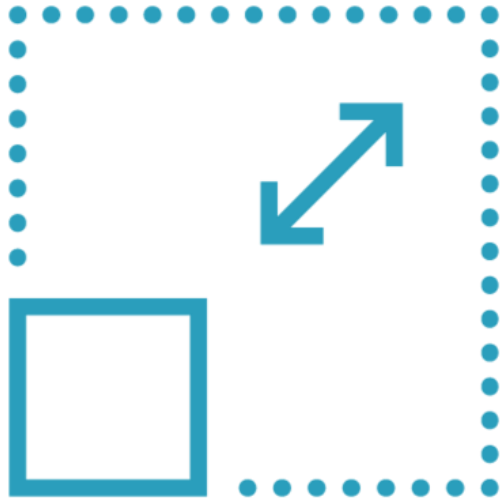
Using Parameters



Parameter Passing

Parameters passed "by value"

Parameter receives a copy
of the original value



Method changes to parameter values

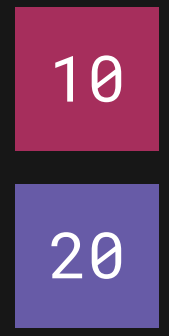
Visible within method

Not visible outside of method

Method Changes to Parameter Values

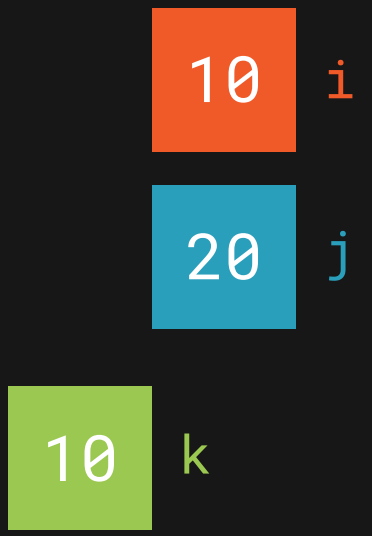
Main.java

```
int val1 = 10;
int val2 = 20;
swap(val1, val2);
System.out.println(val1) // 10
System.out.println(val2) // 20
```

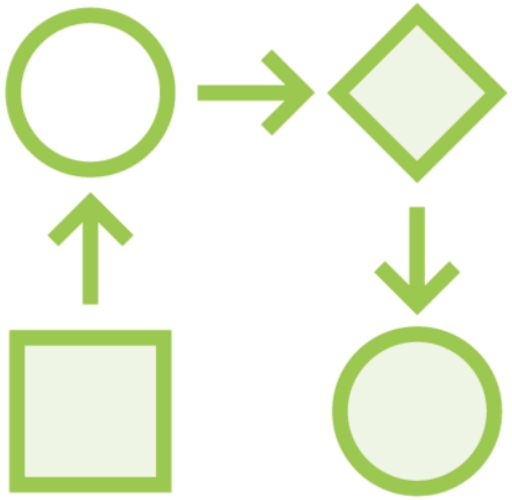


Main.java

```
static void swap(int i, int j) {
  int k = i;
  i = j;
  j = k
  // i:20 j:10
}
```



Reasons a Method Exits

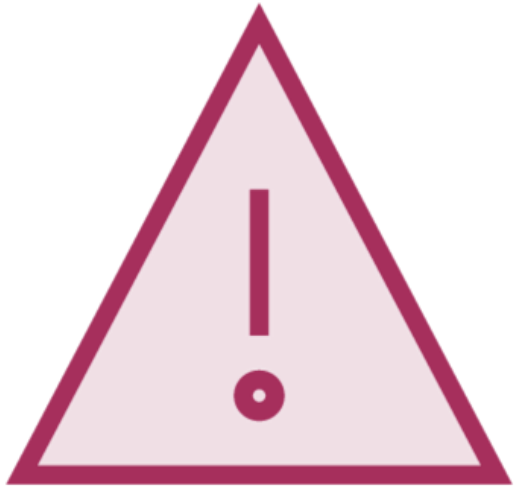


End of method

No more code in method

Return statement

Explicitly exit method



Error occurs

Method abruptly exits

Throws an exception

Exiting a Method

```
showSum(7.5, 1.4, 3);
System.out.println("Back from showSum");
```

```
static void showSum(float x, float y, int count) {
    float sum = x + y;
    for(int i = 0, i < count; i++)
        System.out.println(sum);
    return;
}
```

Exiting a Method

```
showSum(7.5, 1.4, 0);
System.out.println("Back from showSum");
```

```
static void showSum(float x, float y, int count) {
    float sum = x + y;
    for(int i = 0; i < count; i++)
        System.out.println(sum);
    return;
}
```

Exiting a Method

```
showSum(7.5, 1.4, 0);
System.out.println("Back from showSum");

static void showSum(float x, float y, int count) {
    if (count < 1)
        return;
    float sum = x + y;
    for(int i = 0, i < count; i++)
        System.out.println(sum);
    return;
}
```

A method can return a single value

- Value returned with return statement

Method return type

- Can be a primitive type
- Can be a more complex type such as an array

Returning a Value

```
double result = calculateInterest(100d, 0.05d, 10);

System.out.println(result); // 50.0


static double calculateInterest(double amt, double rate, int years) {
    double interest = amt * rate * years;
    return interest;
}
```

Returning a Value

```
double result = calculateInterest(100d, 0.05d, 10);
System.out.println(result); // 50.0


static double calculateInterest(double amt, double rate, int years) {

    return amt * rate * years;
}
```

Returning an Array

```
static double[] produceInterestHistory(double amt, double rate, int years)
{
  double[] accumulatedInterest = new double[years];
  for(int yearIndex = 0; yearIndex < years; yearIndex++) {
    int year = yearIndex + 1;
    accumulatedInterest[yearIndex] = calculateInterest(amt, rate, year);
  }
  return accumulatedInterest;
}
```

Command-line Arguments

Application main method

Serves as program entry point

Receives an array as parameter

Contains command-line arguments

Command-line Arguments

```
java com.pluralsight.example.Main
```

Main.java

```
public static void main(String[] args) {
  if(args.length < 1)
    System.out.println("No args provided");
  else
    for(String arg : args)
      System.out.println(arg);
}
```

Command-line Arguments

```
java com.pluralsight.example.Main Hello “Mary Ann”
```

Main.java

```
public static void main(String[] args) {
  if(args.length < 1)
    System.out.println(“No args provided”);
  else
    for(String arg : args)
      System.out.println(arg);
}
```

```
Hello
Mary Ann
```

Summary

Method

- Mechanism for organizing code
- Enables creation of reusable code

Variables

- Scope limited to method

Summary

Parameters

- Enable passing values to methods
- Parameters passed positionally

Parameters passed “by value”

- A copy of the original value is passed
- Changes made to parameter values not visible outside of method

Summary

Method return value

- Value specified with return statement
- Can be primitive type
- Can be complex type such as an array

Command-line arguments

- Received by app's main method
- Received as String array