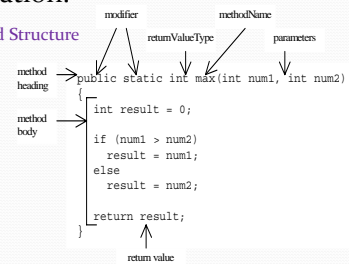## Introducing Methods

A method is a collection of statements that are grouped together to perform an operation.

Method Structure

```
           modifier              methodName
              returnValueType        parameters

method   →  public static int max(int num1, int num2)
heading     {
              int result = 0;
method
body          if (num1 > num2)
                result = num1;
              else
                result = num2;

              return result;
            }
                    ↑
                 return value
```

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Declaring Methods

```
public static int max(int num1, int num2)
{
  if (num1 > num2)
    return num1;
  else
    return num2;
}
```

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Passing Parameters

```
void nPrintln(String message, int n)
{
  for (int i=0; i<n; i++)
    System.out.println(message);
}
```
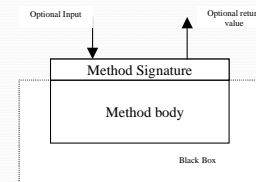
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Overloading Methods

- Example:
  - Overloading the `max` Method

```
double max(double num1, double num2)
{
  if (num1 > num2)
    return num1;
  else
    return num2;
}
```

Method Abstraction

- You can think of the method body as a black box that contains the detailed implementation for the method.

The `Math` Class

- Class constants:
  - PI
  - E
- Class methods:
  - Trigonometric Methods
  - Exponent Methods
  - Miscellaneous

Trigonometric Methods

- `sin(double a)`
- `cos(double a)`
- `tan(double a)`
- `acos(double a)`
- `asin(double a)`
- `atan(double a)`

Exponent Methods

- `exp(double a)`

  Returns e raised to the power of a.

- `log(double a)`

  Returns the natural logarithm of a.

- `pow(double a, double b)`

  Returns a raised to the power of b.

- `sqrt(double a)`

  Returns the square root of a.

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Miscellaneous Methods

- `max(a, b)` and `min(a, b)`

  Returns the maximum or minimum of two parameters.

- `abs(a)`

  Returns the absolute value of the parameter.

- `random()`

  Returns a random `double` value in the range [0.0, 1.0).

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Using Math Methods

- Example
  - Computing Mean and Standard Deviation. Generate 10 random numbers and compute the mean and standard deviation.

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The End

Questions?

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