Math Class

zyBook Chap 2.17

Math Class

- A part of the Java Class Library – `java.lang`
  - Default package
  - No need to import the Math Class explicitly

- Contains predefined constants and common mathematical methods
  - The methods generate/**return** values

How to Use Math Class

Since the mathematical methods and constants are in another class, we use ***dot notation*** to call them:

- **<ClassName>.<methodName>(<parameter(s)>)**
  - `Math.sqrt(4); // square root of 4`

- **<ClassName>.<CONSTATNT_NAME>**
  - `Math.E   // Euler's number`
  - `Math.PI  // π`

Common Math Methods

`sqrt(double x)`

```
Math.sqrt(4.0)  // 2.0
```

- the square root of x in double

`pow(double x, double y)`

```
Math.pow(3.0, 2.0)  // 9.0
```

- the value of x raised to the power of y in double

`abs(int x)`

`abs(double x)`

```
Math.abs(-4)  // 4
```

- the absolute value of x

Common Math Methods

`min(int x, int y)`

`min(double x, double y)`

- the smaller of x and y

```
Math.min(-4, 5)  // -4
```

`max(int x, int y)`

`max(double x, double y)`

- the greater of x and y

```
Math.max(-4, 5)  // 5
```

Common Math Methods

`ceil(double x)`

- the smallest whole number (in double) that is greater than or equal to x

`floor(double x)`

- the largest whole number (in double) that is less than or equal to x

`round(double x)`

- the closest long to x

```
Math.ceil(3.5);  // 4.0

Math.floor(3.5);  // 3.0

Math.round(3.5);  // 4
```

Rounding Real Numbers to N decimal places

Three steps to round a real number to N decimal places:

1. Multiply by 10^N
2. Round
3. Divide by 10^N

```
double result = 1.0 / 3.0;       // 0.333333333333

result = result * 100;           // 33.333333333

result = Math.round(result);     // 33.0

result = result / 100;           // 0.33
```