Operators

Binary Operators

Arithmetic Binary Operators

1. addition, `a + b`
2. subtraction, `a - b`
3. multiplication, `a * b`
4. division, `a / b`
5. modulo operator, `a % b`

```
int a = 11 / 4;
  => a = 2  (FLOOR value)


int b = 11 % 4;
  => b = 3  (reminder of division)


// modulo is often used to determine odd and even numbers
if (n % 2 == 0)
  System.out.println("Number " + n + " is even.");
  else
    System.out.println("Number " + n + " is odd.");
```

Rules of numeric promotion

1. If operands have different data types, Java automatically promotes one of the operands to a larger of two data types.

2. If one value is integer, and another decimal, Java promotes int to decimal.

3. `byte`, `short` and `char` are **always** first promoted to int before the operation is done (!!)

4. The resulting value has the same data type as the promoted operands.

```
short a = 17;

float b = 15;

double c = 35;

System.out.println(a * b / c);

   // a and b are promoted to double, result is double


short x = 5;

short y = 7;

System.out.println(x + y);

   // x and y are promoted to int, result is int


short z = x + y;

   // DOES NOT COMPILE (you try to put int into short)
```