Operator overloading part 1

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Operator Overloading

- **Operators** like +, - , * , are actually **methods**,
- and can be overloaded.

- **Can be overloaded even for existing classes *(folder 0)*.**

What is it good for - 1

- Natural usage.

- compare:
  - **a.set(add(b,c))**
    - to
  - **a= b+c**

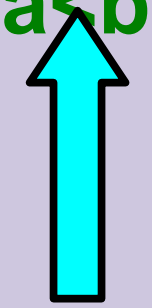
- compare:
  - **v.elementAt(i)= 3**
    - to

v[i]= 3

What is it good for - 2

Uniformity with base types (important for templates)

```
template<typename T>
const T& min(const T& a, const T& b) {
    return a<b ? a : b;
}
```



a and b can be primitives or

user defined objects that have operator <

Complex example *(folder 1)*

Rules

1. **Don't** overload operators with **non-standard** behavior! (<< for adding,...)

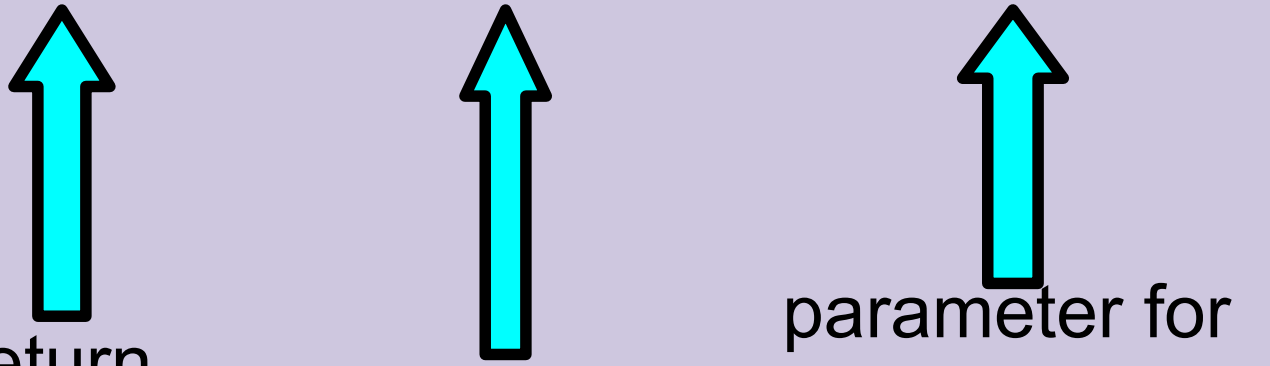
2. Check how operators work on **primitives** or in the **standard library** and give the **same behavior** in your class.

Example of usage in primitives/standard library

- >> << are used as bit operations for **primitives numbers** and for I/O in the **standard library** iostreams classes.
- [] is used as subscripting **primitives arrays** and vector class in the **standard library**.
- () is used for **function calls** and for functor objects in the **standard library**.

Prototype

```
X& operator+=(const X& rval)
```




```
X& operator+=(X& a, const X& b)
```

Invoking an Overloaded Operator

Operator can be invoked as a member function:

```
object1.operator+=(object2);
```

It can also be used in more conventional manner:

```
object1+= object2;
```

Operators ++ -- postfix prefix (folder 7)

```
// Prefix: ++n
HNum& operator++() {
 code that adds one to this HNum
 return *this; // return ref to curr
}

// Postfix : n++
const HNum operator++(int) {
 Hnum cpy(*this); // calling copy ctor
 code that adds one to this HNum
 return cpy;
}
```

A flag that makes it postfix