OVERLOADED operator<< AND operator>>

Input and Output functions

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REVIEWING FUNCTION OVERLOADING

- Overloaded functions must have unique argument lists
  - void f(int x);
  - void f(int x, int y);
  - int function(int x);
  - double function(double x);
  - void print(ostream out, int x);
  - void print(ostream out, double x)

<iostream>

class ostream

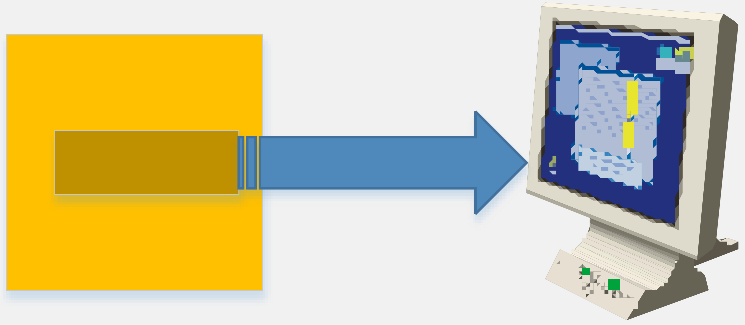
```
friend ostream& operator<<(ostream&, char);
friend ostream& operator<<(ostream&, char*);
friend ostream& operator<<(ostream&, short);
friend ostream& operator<<(ostream&, int);
friend ostream& operator<<(ostream&, long);
friend ostream& operator<<(ostream&, float);
friend ostream& operator<<(ostream&, double);
```

class istream

```
friend istream& operator>>(istream&, char&);
friend istream& operator>>(istream&, char*);
friend istream& operator>>(istream&, short&);
friend istream& operator>>(istream&, int&);
friend istream& operator>>(istream&, long&);
friend istream& operator>>(istream&, float&);
friend istream& operator>>(istream&, double&);
```

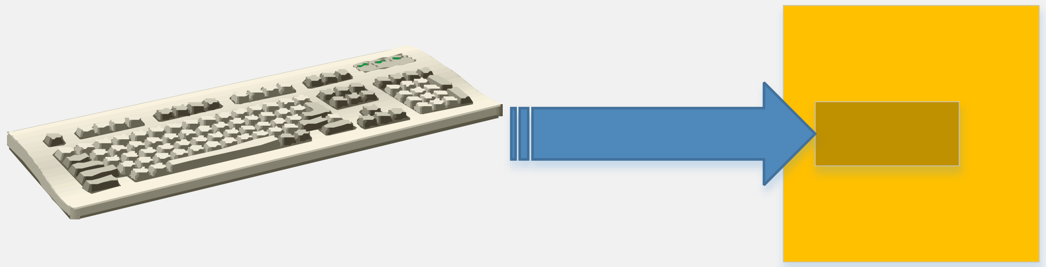
operator<< THE INSERTER

- ALWAYS a friend function
- ALWAYS follows the same pattern:
  - returns ostream reference
  - first argument ostream reference
  - second argument reference to the friending class



```
friend ostream& operator<<(ostream& out, foo& me)
{
    out << me.field << endl;
    return out;
}
```

operator>>
THE EXTRACTOR



- ALWAYS a friend function
- ALWAYS follows the same pattern:
  - returns istream reference
  - first argument istream reference
  - second argument reference to the friending class

```
friend istream& operator>>(istream& in, foo& me)
{
    in >> me.field;
    return in;
}
```

CLASS SPECIFICATION:
length.h

```
class length
{
    private:
        int feet;
        int inches;

    public:
               .
               .
               .
        friend ostream& oprator<<(ostream& out, length& len);
        friend istream& oprator>>(istream& in, length& len);
               .
               .
               .
};
```

FUNCTION DEFINITIONS: length.cpp

```
ostream& operator<<(ostream& out, length& len)
{
    out << "(" << len.feet << ", " << len.inches << ")";

    return out;
}

istream& operator>>(istream& in, length& len)
{
    cout << "Please enter the real part: ";
    in >> len.feet;
    cout << "Please enter the imaginary part: ";
    in >> len.inches;

    return in;
}
```