

# C++ STL

CpSc102 – Fall 2010

# What is C++ STL?

- STL: Standard Template Library
  - Lists
  - Algorithms
  - Vectors
  - Maps
  - Vectors
  - Stacks
  - Iterators
  - More ...

# Use list template

```
#include <list>
```

# List class members

- front: access first element
- back: access last element
- empty: checks if there are no elements
- size: returns the number of elements stored
- clear: removes all elements
- push\_back: add an element to the end of the list
- push\_front: add an element to the front of the list
- pop\_back: removes the last element of the list
- pop\_front: removes the first element of the list
- remove: removes elements from a list
- more ...

# Create the list

```
data_t * data=NULL;
std::string      name;
list<data_t* >   items;
list<data_t* >::iterator    dp;
list<data_t* >::const_iterator    cdp;

// read input file consisting of names and id codes adding entities to items
while(!std::cin.eof()) {
    std::cin >> name >> num;
    if(std::cin.good()) {
        data = new data_t(name,num);
        items.push_back(data);
    }
}
```

# Print the list

```
for(cdp=items.begin(); cdp!=items.end(); cdp++)  
    std::cout << *cdp;
```

# Delete a link

```
for(dp=items.begin(); dp!=items.end(); )
    if((*dp)->name == "Gary") {
        delete *dp;
        dp = items.erase(dp);
    }else{
        dp++;
    }
}
```

# Delete the list

```
for(dp=items.begin(); dp!=items.end(); dp=items.erase(dp))  
    if(*dp) delete *dp;
```



# data\_t

```
data_t(std::string iname="",int iid=-1) : name(iname), id(iid)
{ };

friend std::ostream& operator<<(std::ostream& s, const data_t& rhs){
    s << rhs.name << " " << rhs.id << std::endl;
    return s;
}
friend std::ostream& operator<<(std::ostream& s, data_t *rhs){
    return(s << (*rhs));
}

public:
std::string  name; // data name
int         id; // data id code
```