

## Growing Arrays 20060221

```
$ pico chgsz1.cpp
#include <iostream>
#include <string>

struct person
{ string name, address;
  int birth;

  person(string n, string a, int b)
  { name=n;
    address=a;
    birth=b; }

  // other methods, etc.
};

ostream & operator << (ostream & stream, const person & p)
{
  stream << "person(" << p.name << ", " << p.address << ", " << p.birth << ")";
  return stream;
}

void main()
{
  person p1("Piglet Smith", "1234 Dog St, Alabama", 19850621);
  person p2("Ignatious Bungalow", "2345 Cat Ave, Alaska", 19681217);
  person p3("Jennifer Candle", "3456 Horse Dr, Australia", 19780531);

  cout << "p1 = " << p1 << "\n";
  cout << "p2 = " << p2 << "\n";
  cout << "p3 = " << p3 << "\n";
}

$ CC chgsz1.cpp
$ a.out
p1 = person(Piglet Smith, 1234 Dog St, Alabama, 19850621)
p2 = person(Ignatious Bungalow, 2345 Cat Ave, Alaska, 19681217)
p3 = person(Jennifer Candle, 3456 Horse Dr, Australia, 19780531)
```

```

$ pico chgsz2.cpp
#include <iostream>
#include <string>

class person
{ protected:
    string name, address;
    int birth;

public:
    person(string n, string a, int b)
    { name=n;
      address=a;
      birth=b; }

    void change_name(string n)
    { name=n; }

    string get_name()
    { return name; }

    void change_address(string a)
    { address=a; }

    string get_address()
    { return address; }

    void change_birth(int b)
    { birth=b; }

    int get_birth()
    { return birth; }

    friend ostream & operator << (ostream & stream, const person & p);

    // other methods, etc.
};

ostream & operator << (ostream & stream, const person & p)
{
    stream << "person(" << p.name << ", " << p.address << ", " << p.birth << ")";
    return stream;
}

void main()
{
    person p1("Piglet Smith", "1234 Dog St, Alabama", 19850621);
    person p2("Ignatious Bungalow", "2345 Cat Ave, Alaska", 19681217);
    person p3("Jennifer Candle", "3456 Horse Dr, Australia", 19780531);
    p2.change_address(p1.get_address());

    cout << "p1 = " << p1 << "\n";
    cout << "p2 = " << p2 << "\n";
    cout << "p3 = " << p3 << "\n";
}

$ CC chgsz2.cpp
$ a.out
p1 = person(Piglet Smith, 1234 Dog St, Alabama, 19850621)
p2 = person(Ignatious Bungalow, 1234 Dog St, Alabama, 19681217)
p3 = person(Jennifer Candle, 3456 Horse Dr, Australia, 19780531)

```

```
$ pico chgsz3.cpp
#include <iostream>

int * resize_array(int * old_array, int old_size, int new_size)
{
    int * result = new int [new_size];

    int num_to_copy = old_size;
    if (new_size<old_size)
        num_to_copy = old_size;

    for (int i=0; i<num_to_copy; i+=1)
        result[i] = old_array[i];

    delete[] old_array;

    return result;
}
```

```
void main()
{
    int * data = new int [4];

    data[0]=123;
    data[1]=234;
    data[2]=345;
    data[3]=456;

    data = resize_array(data, 4, 7);

    data[4]=5678;
    data[5]=6789;
    data[6]=7890;

    for (int i=0; i<7; i+=1)
        cout << "data[" << i << "] = " << data[i] << "\n";
}
```

```
$ CC chgsz3.cpp
$ a.out
data[0] = 123
data[1] = 234
data[2] = 345
data[3] = 456
data[4] = 5678
data[5] = 6789
data[6] = 7890
```

```

$ pico chgsz4.cpp
#include <iostream>
#include <string>

struct person
{ string name, address;
  int birth;

  person(string n, string a, int b)
  { name=n;
    address=a;
    birth=b; }

  // other methods, etc.
};

ostream & operator << (ostream & stream, const person & p)
{
  stream << "person(" << p.name << ", " << p.address << ", " << p.birth << ")";
  return stream;
}

person * resize_array(person * old_array, int old_size, int new_size)
{
  person * result = new person [new_size];

  int num_to_copy = old_size;
  if (new_size<old_size)
    num_to_copy = old_size;

  for (int i=0; i<num_to_copy; i+=1)
    result[i] = old_array[i];

  delete[] old_array;

  return result;
}

void main()
{
  person * data = new person[3];

  data[0] = person("Piglet Smith", "1234 Dog St, Alabama", 19850621);
  data[1] = person("Ignatious Bungaloo", "2345 Cat Ave, Alaska", 19681217);
  data[2] = person("Jennifer Candle", "3456 Horse Dr, Australia", 19780531);

  data = resize_array(data, 3, 6);

  data[3] = person("Al Steeveerepair", "7654 Ant Rd, Orgeon", 19200421);
  data[4] = person("Belinda Bat", "221B Baker St, Connecticut", 19470704);

  for (int i=0; i<5; i+=1)
    cout << "data[" << i << "] = " << data[i] << "\n";
}

```

```
$ CC chgsz4.cpp
chgsz4.cpp: In function `struct person * resize_array(person *, int, int)':
chgsz4.cpp:24: no matching function for call to `person::person ()'
chgsz4.cpp:9: candidates are:
person::person(basic_string<char,string_char_traits<char>,__default_alloc_template<fa
lse,0> >, basic_)
chgsz4.cpp:14:             person::person(const person &)
chgsz4.cpp: In function `int main(...)':
chgsz4.cpp:40: no matching function for call to `person::person ()'
chgsz4.cpp:9: candidates are:
person::person(basic_string<char,string_char_traits<char>,__default_alloc_template<fa
lse,0> >, basic_)
chgsz4.cpp:14:             person::person(const person &)
```

```

$ pico chgsz5.cpp
#include <iostream>
#include <string>

struct person
{ string name, address;
  int birth;

  person()
  { }

  person(string n, string a, int b)
  { name=n;
    address=a;
    birth=b; }

  // other methods, etc.
};

// the rest is as before.

void main()
{
  person * data = new person[3];

  data[0] = person("Piglet Smith", "1234 Dog St, Alabama", 19850621);
  data[1] = person("Ignatious Bungalow", "2345 Cat Ave, Alaska", 19681217);
  data[2] = person("Jennifer Candle", "3456 Horse Dr, Australia", 19780531);

  data = resize_array(data, 3, 6);

  data[3] = person("Al Steeveerepair", "7654 Ant Rd, Orgeon", 19200421);
  data[4] = person("Belinda Bat", "221B Baker St, Connecticut", 19470704);

  for (int i=0; i<5; i+=1)
    cout << "data[" << i << "] = " << data[i] << "\n";
}

```

```

$ CC chgsz5.cpp
$ a.out
data[0] = person(Piglet Smith, 1234 Dog St, Alabama, 19850621)
data[1] = person(Ignatious Bungalow, 2345 Cat Ave, Alaska, 19681217)
data[2] = person(Jennifer Candle, 3456 Horse Dr, Australia, 19780531)
data[3] = person(Al Steeveerepair, 7654 Ant Rd, Orgeon, 19200421)
data[4] = person(Belinda Bat, 221B Baker St, Connecticut, 19470704)

```