```
/* The following code example is taken from the book
 * "The C++ Standard Library - A Tutorial and Reference"
 * by Nicolai M. Josuttis, Addison-Wesley, 1999
 *
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 */
namespace std {
   template <class T>
   class allocator {
     public:
       // type definitions
       typedef size_t    size_type;
       typedef ptrdiff_t difference_type;
       typedef T*        pointer;
       typedef const T*  const_pointer;
       typedef T&        reference;
       typedef const T&  const_reference;
       typedef T         value_type;

       // rebind allocator to type U
       template <class U>
       struct rebind {
           typedef allocator<U> other;
       };

       // return address of values
       pointer address (reference value) const {
           return &value;
       }
       const_pointer address (const_reference value) const {
           return &value;
       }

       /* constructors and destructor
        * - nothing to do because the allocator has no state
        */
       allocator() throw() {
       }
       allocator(const allocator&) throw() {
       }
       template <class U>
         allocator (const allocator<U>&) throw() {
       }
       ~allocator() throw() {
       }

       // return maximum number of elements that can be allocated
       size_type max_size () const throw() {
           return numeric_limits<size_t>::max() / sizeof(T);
       }

       // allocate but don't initialize num elements of type T
```

```
        pointer allocate (size_type num,
                          allocator<void>::const_pointer hint = 0) {
            // allocate memory with global new
            return (pointer)(::operator new(num*sizeof(T)));
        }

        // initialize elements of allocated storage p with value value
        void construct (pointer p, const T& value) {
            // initialize memory with placement new
            new((void*)p)T(value);
        }

        // destroy elements of initialized storage p
        void destroy (pointer p) {
            // destroy objects by calling their destructor
            p->~T();
        }

        // deallocate storage p of deleted elements
        void deallocate (pointer p, size_type num) {
            // deallocate memory with global delete
            ::operator delete((void*)p);
        }
    };

    // return that all specializations of this allocator are interchangeable
    template <class T1, class T2>
    bool operator== (const allocator<T1>&,
                     const allocator<T2>&) throw() {
        return true;
    }
    template <class T1, class T2>
    bool operator!= (const allocator<T1>&,
                     const allocator<T2>&) throw() {
        return false;
    }
}
```