

HW6 Vector

Given the declaration of a class template `vector` below, write the bodies of the functions, and a `main()` to test all the facilities `vector` provides

```
template <class T>
class Vector {
public:
    Vector();                // creates an empty vector
    Vector(int size);        // creates a vector for holding 'size' elements
    Vector(const Vector& r);  // the copy ctor
    ~Vector();               // destructs the vector
    T& operator[](int index); // accesses the specified element without
    // bounds checking
    T& at(int index);        // accesses the specified element, throws an
    // exception of type 'std::out_of_range' when index <0 or >=m_nSize
    int size() const;        // return the size of the container
    void push_back(const T& x); // adds an element to the end
    void clear();            // clears the contents
    bool empty() const;      // checks whether the container is empty
private:
    void inflate();          // expand the storage of the container to a new
    // capacity, e.g. 2*m_nCapacity
    T *m_pElements;         // pointer to the dynamically allocated storage
    int m_nSize;             // the number of elements in the container
    int m_nCapacity;         // the number of elements that can be held in
    // currently allocated storage
};
```

test result

```

current vector size is 10
at(i) element is 0
at(i) element is 1
at(i) element is 2
at(i) element is 3
at(i) element is 4
at(i) element is 5
at(i) element is 6
at(i) element is 7
at(i) element is 8
at(i) element is 9
x[i] element is 0
x[i] element is 1
x[i] element is 2
x[i] element is 3
x[i] element is 4
x[i] element is 5
x[i] element is 6
x[i] element is 7
x[i] element is 8
x[i] element is 9
z[i] is 0 x[i] is 0
z[i] is 1 x[i] is 1
z[i] is 2 x[i] is 2
z[i] is 3 x[i] is 3
z[i] is 4 x[i] is 4
z[i] is 5 x[i] is 5
z[i] is 6 x[i] is 6
z[i] is 7 x[i] is 7
z[i] is 8 x[i] is 8
z[i] is 9 x[i] is 9
x is not empty now
after x.clear() Vector x size = 0
after x.clear() Vector x is empty
size elements initialized Vector u's size is 10
u[i] are initialized as 0
u[i] are initialized as 0
u[i] are initialized as 0
u[i] are initialized as 0
u[i] are initialized as 0
u[i] are initialized as 0
u[i] are initialized as 0
u[i] are initialized as 0
u[i] are initialized as 0
u[i] are initialized as 0
name is byf ID is 1 age is 17

```

```

name is yxy ID is 2 age is 18
name is dyb ID is 3 age is 18
name is zyy ID is 4 age is 19
name is zyr ID is 5 age is 20
name is zfy ID is 6 age is 21
name is sml ID is 7 age is 22
name is zrz ID is 8 age is 23
name is cyw ID is 9 age is 24
name is sqs ID is 10 age is 25
terminate called after throwing an instance of 'std::out_of_range'
what(): vector::_M_range_check: __n >= this->size()
请按任意键继续. . .

```