

CSE 143 Au00 Quiz 3 – October 24, 2000

The following code gives the definition and implementation of a simple class Box. Objects of class Box hold a single integer value, and methods are provided to access and change that value. The only trick is that storage for the integer value is allocated on the heap, not local to the object.

For this quiz, **complete the bodies of the destructor, copy constructor, and assignment operator** for class Box. Hint: it's simpler than the Vector class presented in lecture.

```
// Boxed (heap-allocated) integer
class Box {
public:
    // construct Box with value 0
    Box();
    // destructor
    ~Box();
    // copy constructor
    Box(const Box &other);
    // assignment
    Box &operator=(const Box &other);
    // value access and modify
    int getValue() const;
    void setValue(int val);
private:
    int *value;          // pointer to heap allocated value
};

// construct Box with value 0
Box::Box() {
    value = new int;
    *value = 0;
}

// destructor
Box::~~Box() {
    delete value;
}

// copy constructor
Box::Box(const Box &other) {
    value = new int;
    *value = *other.value;
}
}
```

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```
// assignment
Box & Box::operator=(const Box &other) {
    // exit if assigning to self
    // (not strictly necessary in this particular example)
    if (&other == this)
        return *this;

    // copy value and return
```

```
    *value = *other.value;
    return *this;
```

```
}
```

```
// access and modify value

int Box::getValue() const {
    return *value;
}

void Box::setValue(int val) {
    *value = val;
}
```