Lecture 13

Ch 7.3, Vectors
Topics

• What is this thing?
• Declaring a vector
• Accessing an element
• push_back
• size
• capacity
• reserve
What is this thing?

• Think of it as a smart array
• It will resize automatically when needed
• Adding elements out of order is easy
• It keeps track of number of elements used
• Allows you to set the initial value yourself
Declaring a vector

```cpp
#include <vector>

vector <bool> vectorB;

vector <int> vectorI (10, 9001);
  – 10 elements each set to 9001

vector <int> copyVectorI(vectorI);
  – Makes a copy of vectorI
```
Accessing an element

• `vectorI[3] = 100;`
  – Changes the 4\textsuperscript{th} element to 100

• `vectorI.begin()`
  – Gets the first element of the vector

• `vectorI.end()`
  – Gets the last element of the vector
push_back

• Allows you to add elements at the back of a vector.

• vector1.push_back(9002);
  – An 11th value is added to the vector of value 9002
size

• Returns the size of the vector (the used size)
  – vector1.size()
    • This would return 11 since we just added an element
      \((10 + 1)\)
capacity

- Is the amount of memory currently allocated
- Think of this as the MAX_SIZE for an array
reserver

• Every time a vector has to resize itself it takes extra time.

• To reduce this overhead
  – You can manually set a size for it.
    • vectorl.reserve(9000);
    • vectorl.reserve(vectorl.size() + 10);