

# CSE 333 – SECTION 7

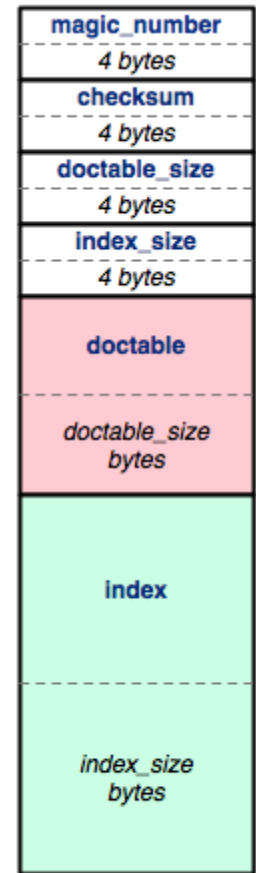
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- HW3 Hex View
- Inheritance Constructors/Destructors
- Static vs Dynamic Dispatch

# Hex View

1. Find a hex editor.
2. Learn 'goto offset' command.
3. See HW3 pictures.

```
0000000: cafe f00d 1c42 4620 0000 205b 0000 075d  ....BF .. [...]
0000010: 0000 0400 0000 0000 0000 2014 0000 0001  ....
0000020: 0000 2014 0000 0001 0000 2031 0000 0001  .. ..... 1....
0000030: 0000 204e 0000 0000 0000 206b 0000 0000  .. N..... k....
0000040: 0000 206b 0000 0000 0000 206b 0000 0000  .. k..... k....
0000050: 0000 206b 0000 0000 0000 206b 0000 0000  .. k..... k....
```



index file

The header:

**Magic word**    **Checksum**    **Doctable size**    **Index size**

# Hex View

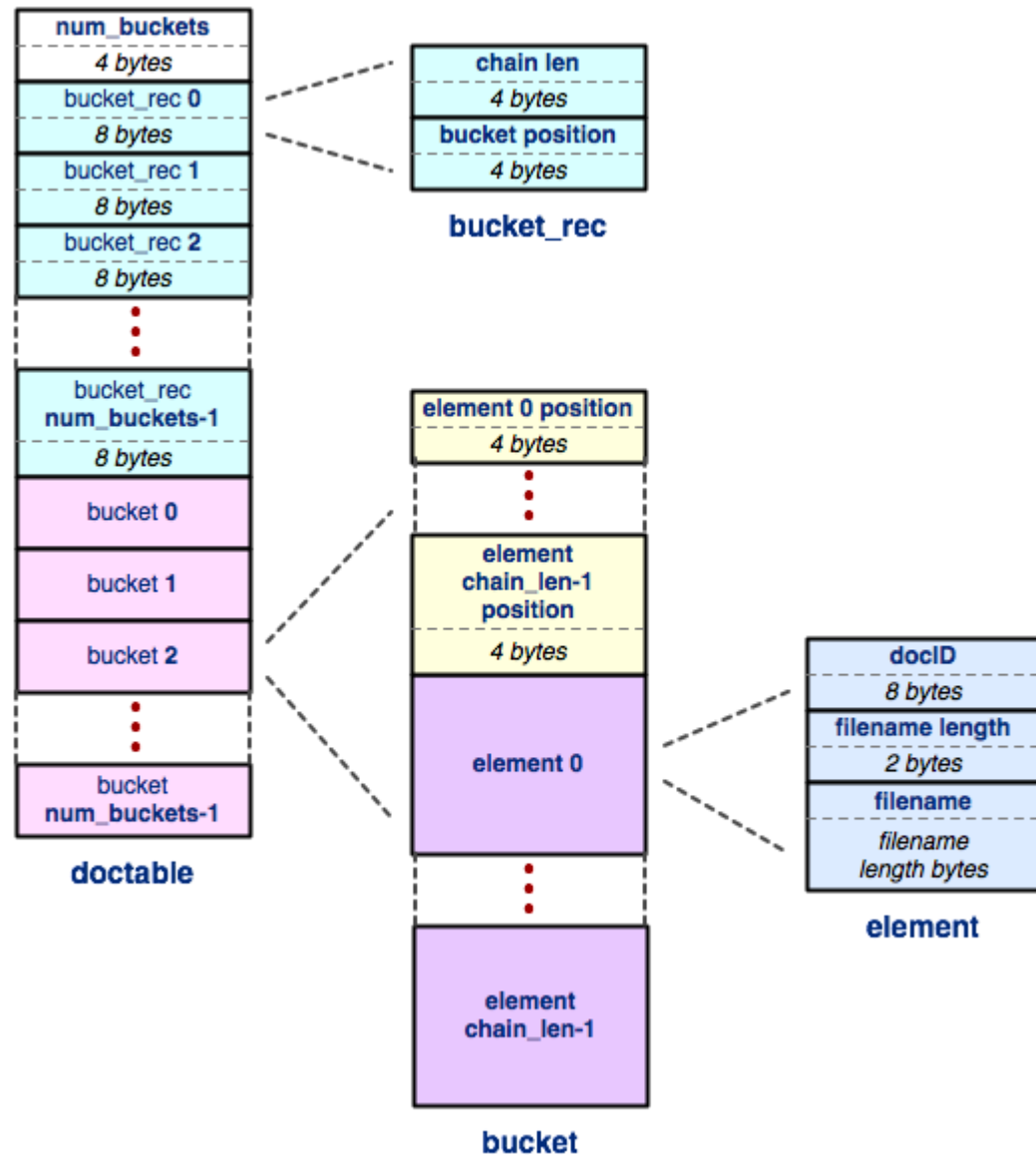
- emacs “M-x hexl-mode”

```
File Edit Options Buffers Tools Hexl Help
87654321 0011 2233 4455 6677 8899 aabb ccdd eeff 0123456789abcdef
00000000: cafe f00d ce52 0578 0000 205e 0000 0944 .....R.x.. ^...D
00000010: 0000 0400 0000 0000 0000 2014 0000 0001 .....
00000020: 0000 2014 0000 0001 0000 2032 0000 0001 .. ..... 2....
00000030: 0000 2050 0000 0000 0000 206e 0000 0000 .. P..... n....
00000040: 0000 206e 0000 0000 0000 206e 0000 0000 .. n..... n....
00000050: 0000 206e 0000 0000 0000 206e 0000 0000 .. n..... n....
```

- vim “:%!xxd”

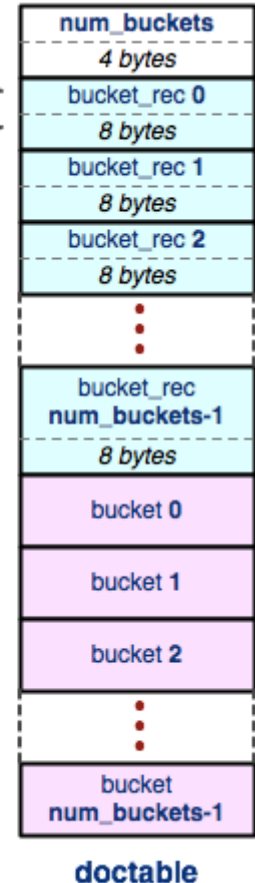
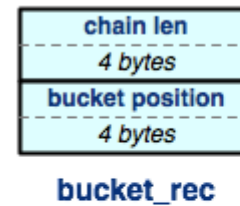
```
0000000: cafe f00d 1c42 4620 0000 205b 0000 075d .....BF .. [...]
0000010: 0000 0400 0000 0000 0000 2014 0000 0001 .....
0000020: 0000 2014 0000 0001 0000 2031 0000 0001 .. ..... 1....
0000030: 0000 204e 0000 0000 0000 206b 0000 0000 .. N..... k....
0000040: 0000 206b 0000 0000 0000 206b 0000 0000 .. k..... k....
0000050: 0000 206b 0000 0000 0000 206b 0000 0000 .. k..... k....
```

# Hex View



The doctable

# Hex View



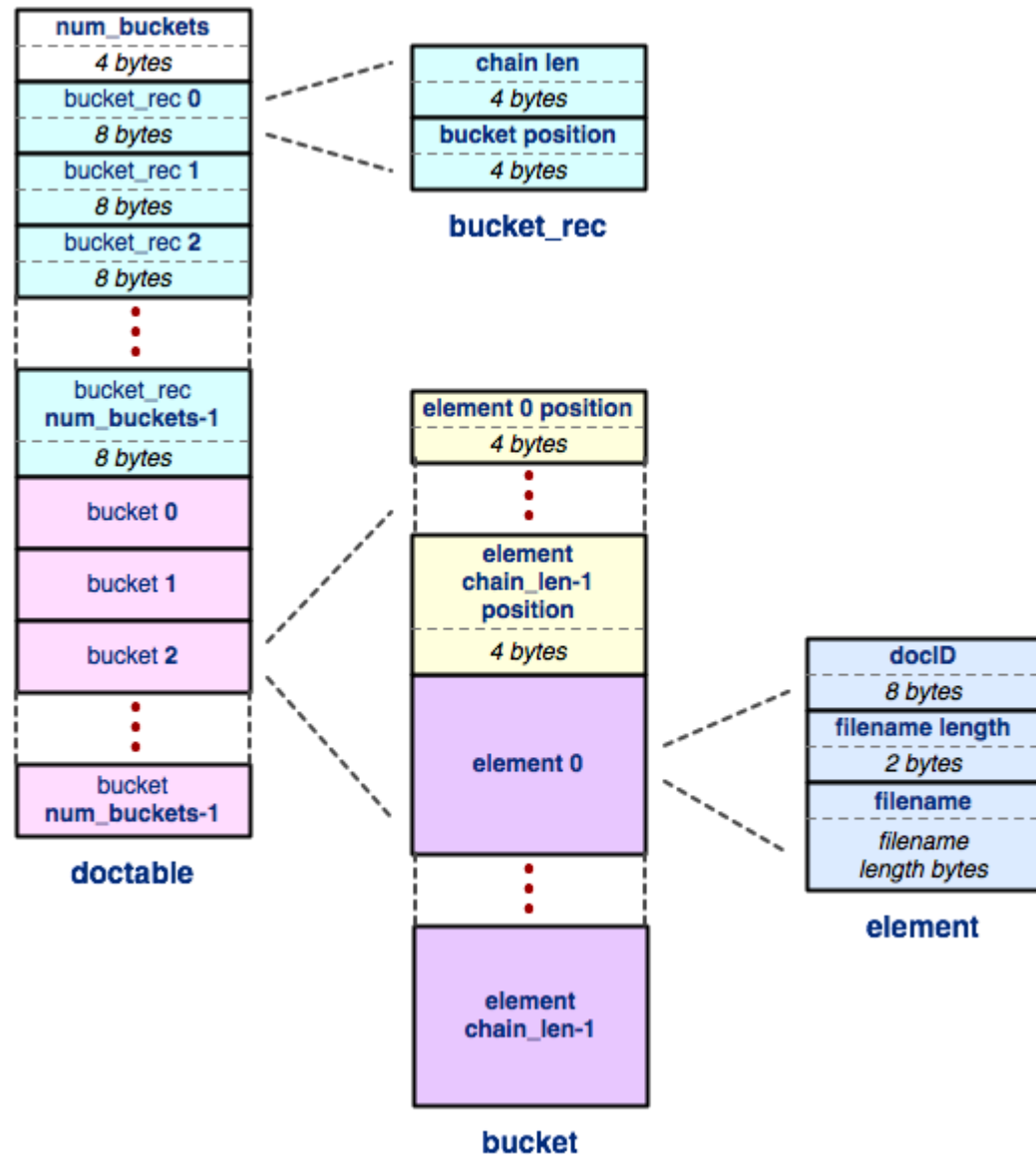
```

0000000: cafe f00d 1c42 4620 0000 205b 0000 075d  ....BF .. [...]
0000010: 0000 0400 0000 0000 0000 2014 0000 0001  .....
0000020: 0000 2014 0000 0001 0000 2031 0000 0001  .. ..... 1....
0000030: 0000 204e 0000 0000 0000 206b 0000 0000  .. N..... k....
0000040: 0000 206b 0000 0000 0000 206b 0000 0000  .. k..... k....
0000050: 0000 206b 0000 0000 0000 206b 0000 0000  .. k..... k....
0002000: 0000 206b 0000 0000 0000 206b 0000 0000  .. k..... k....
0002010: 0000 206b 0000 2018 0000 0000 0000 0001  .. k.. .....
0002020: 000f 736d 616c 6c5f 6469 722f 632e 7478  ..small_dir/c.tx
0002030: 7400 0020 3500 0000 0000 0000 0200 0f73  t.. 5.....s
0002040: 6d61 6c6c 5f64 6972 2f62 2e74 7874 0000  mall_dir/b.txt..
0002050: 2052 0000 0000 0000 0003 000f 736d 616c  R.....smal
0002060: 6c5f 6469 722f 612e 7478 7400 0000 8000  l_dir/a.txt....
0002070: 0000 0000 0024 6f00 0000 0000 0024 6f00  ....$o.....$o.
    
```

The doctable (part 1):

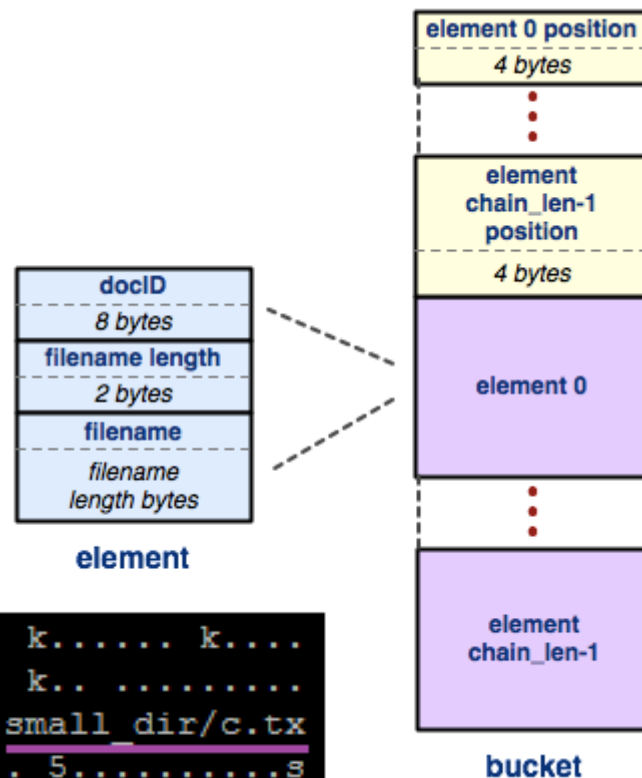
Num buckets ( Chain len Bucket offset )\*

# Hex View



The doctable

# Hex View



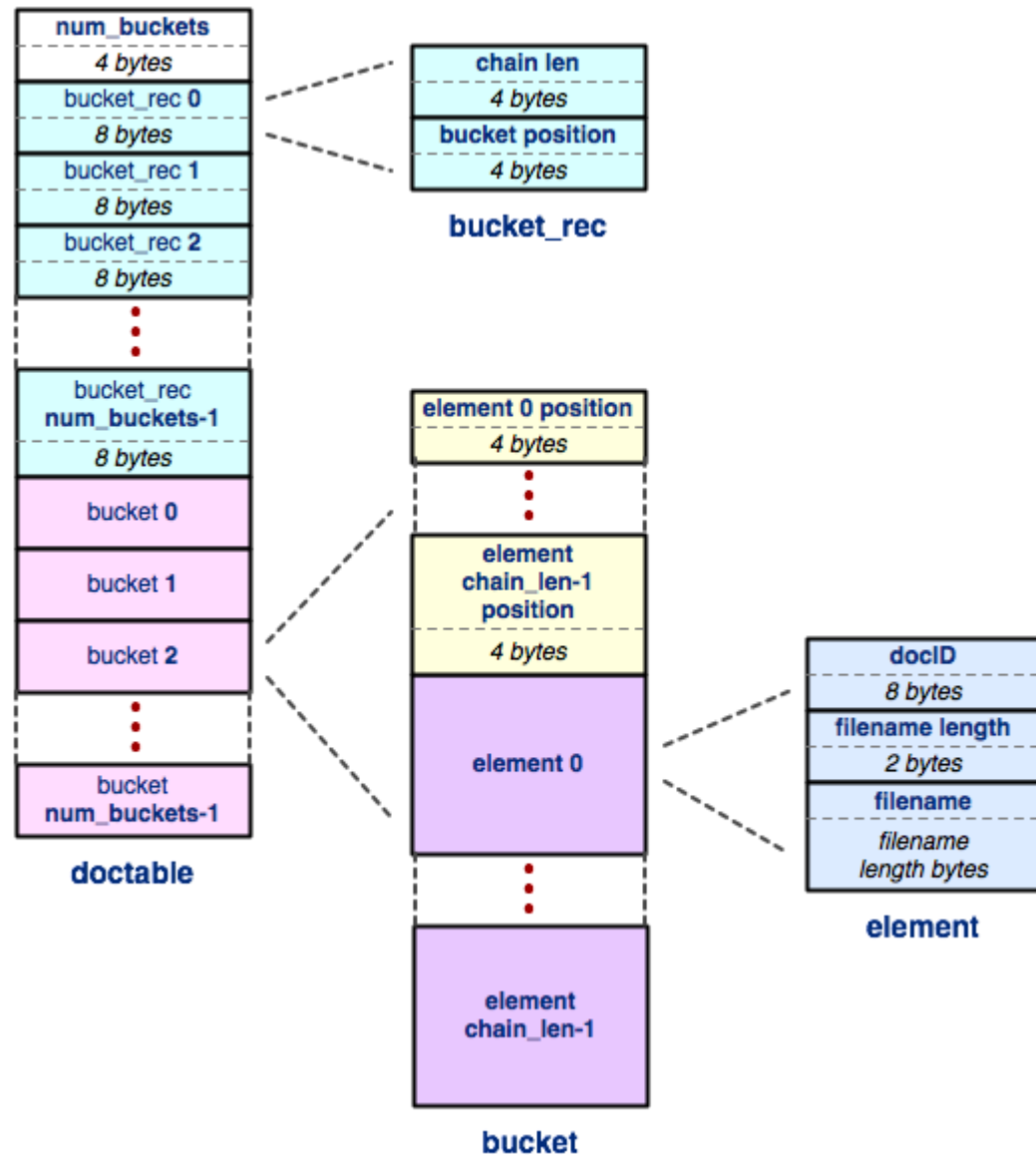
```

0002000: 0000 206b 0000 0000 0000 206b 0000 0000  .. k..... k....
0002010: 0000 206b 0000 2018 0000 0000 0000 0001  .. k.. .....
0002020: 000f 736d 616c 6c5f 6469 722f 632e 7478  ..small_dir/c.tx
0002030: 7400 0020 3500 0000 0000 0000 0200 0f73  t.. 5.....s
0002040: 6d61 6c6c 5f64 6972 2f62 2e74 7874 0000  mall_dir/b.txt..
  
```

The doctable (part 2):

$$\left( \left( \text{Element offset} \right)^n \left( \text{DocID} \quad \text{Filename len} \quad \text{Filename} \right)^n \right)^*$$

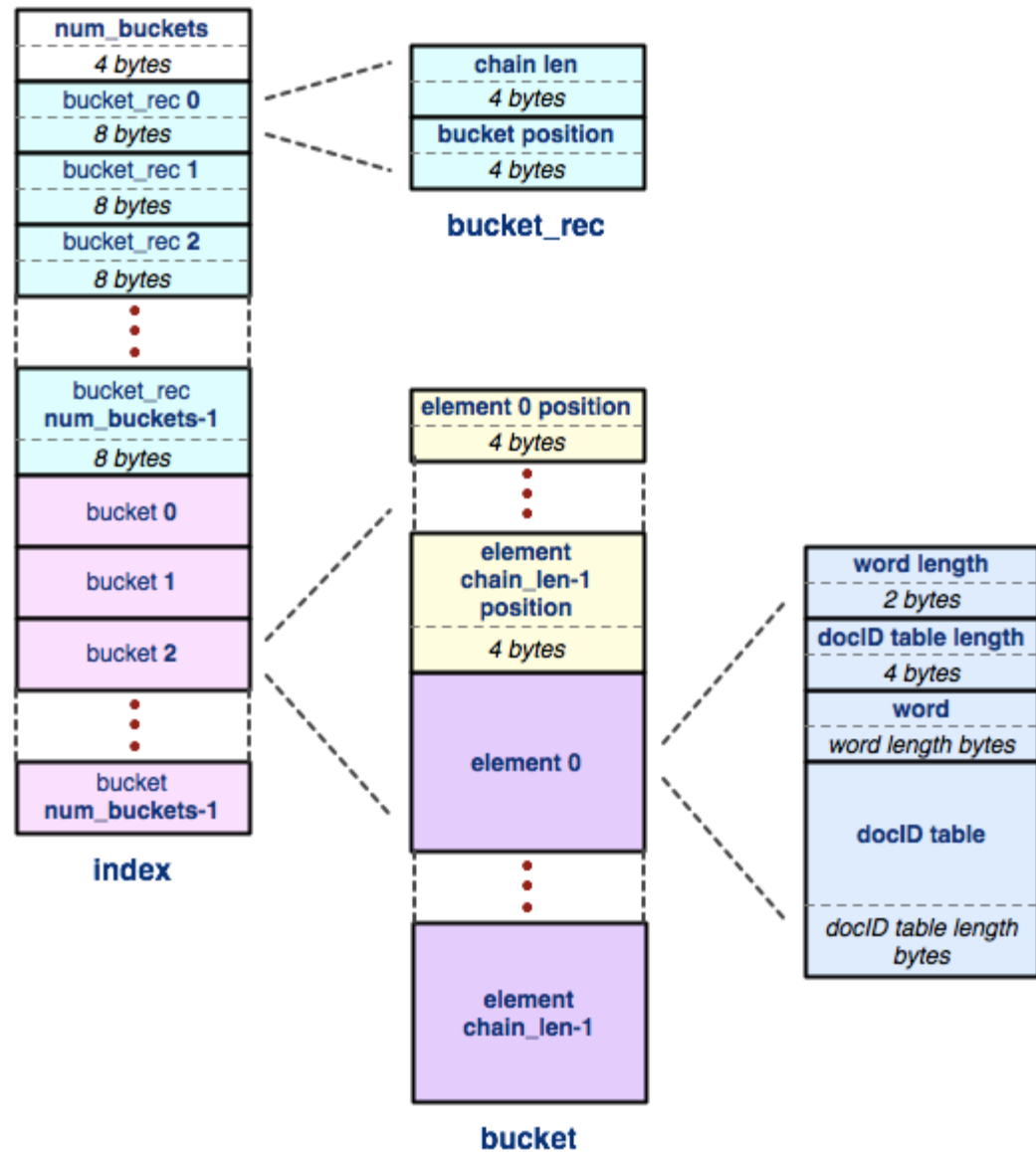
# Hex View



The doctable

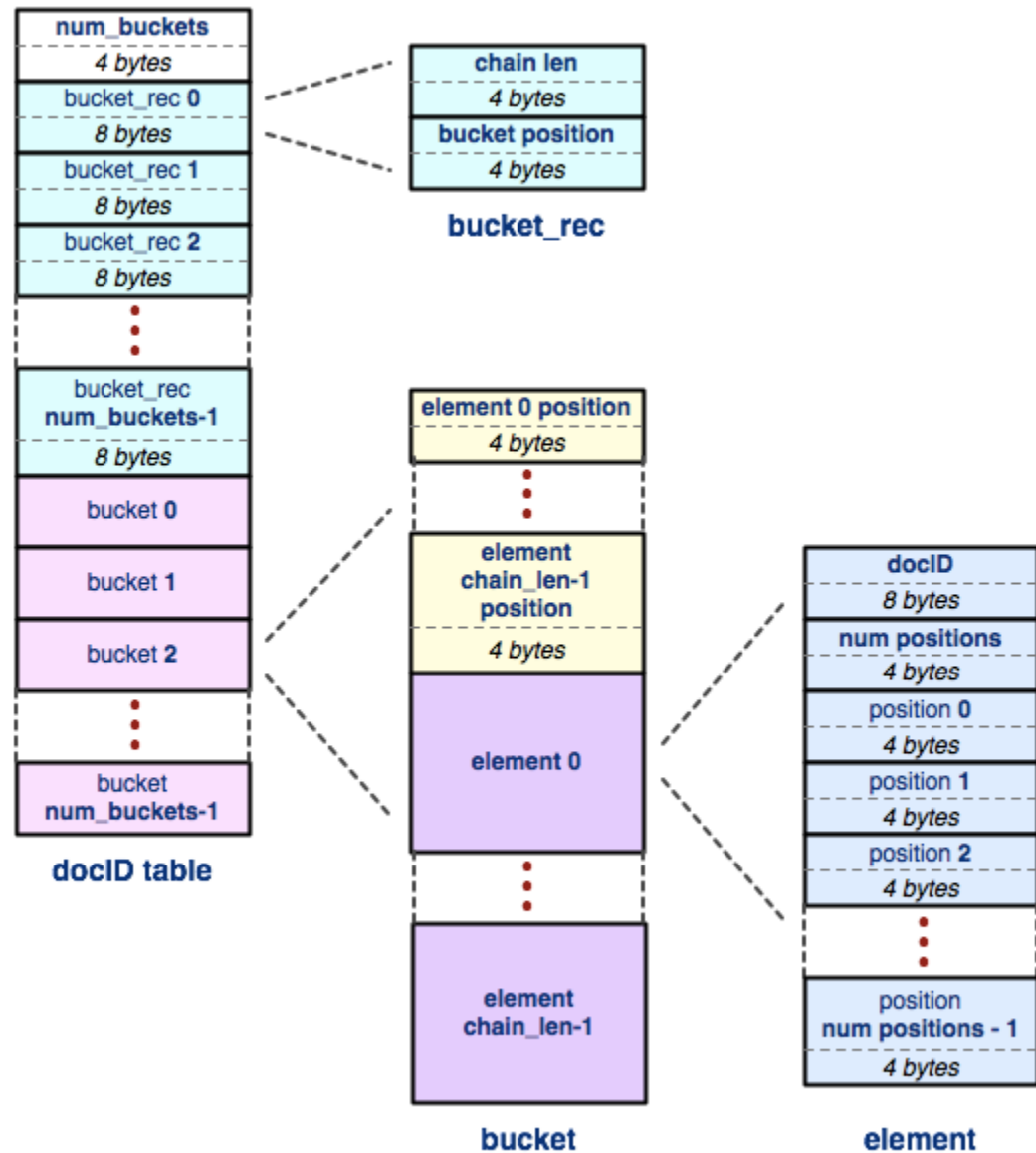


# Hex View



The index

# Hex View



The docID table

# Hex View Demo

- Demo:
  - `tinytree/`
  - `tiny.idx`
  - `teeny.idx`

# Inheritance Constructors/Destructors

- The derived class:
  - Does not inherit any constructors.
  - MUST call their base class constructor.
    - Omission == calling the default constructor.
- Constructors resolve from base to derived.
- Destructors should be virtual !
- Demo: destructex.cc and vtable.cc

# Section Exercise

```
class B {
public:
    B(int *k) : k_(k) { out("B::cons"); }
    void p() { out("B::p"); }
    virtual void q() { out("B::q"); }
    void operator=(B &rhs) { out("B::="); }
    ~B() { out("B::~"); }
protected:
    int *k_;
};

class Der : public B {
public:
    Der() : B(new int(9)) { out("Der::cons"); }
    void p() { out("Der::p"); }
    virtual void q() { out("Der::q"); }
    void operator=(Der &rhs) { out("Der::=" ); }
    ~Der() { delete k_; out("Der::~"); }
};
```

```
void out(string s) { cout << s << endl; }

void main() {
    B base(nullptr), *baseptr;
    Der der;

    base = der;
    base.p();
    base.q();

    baseptr = (B *) new Der;
    baseptr->p();
    baseptr->q();

    der.p();
    der.q();
    delete baseptr;
}
```

# Section Exercise

```
void main() {  
    B base(nullptr), *baseptr;  
    Der der;  
  
    base = der;  
    base.p();  
    base.q();  
  
    baseptr = (B *) new Der;  
    baseptr->p();  
    baseptr->q();  
  
    der.p();  
    der.q();  
    delete baseptr;  
}
```

- B::cons
- B::cons
- Der::cons
  
- B::=
- B::p
- B::q
  
- B::cons
- Der::cons
- B::p
- Der::q
  
- Der::p
- Der::q
- B::~
  
- Der::~
- B::~
- B::~
  
- Note that destructor behavior is undefined if not virtual!