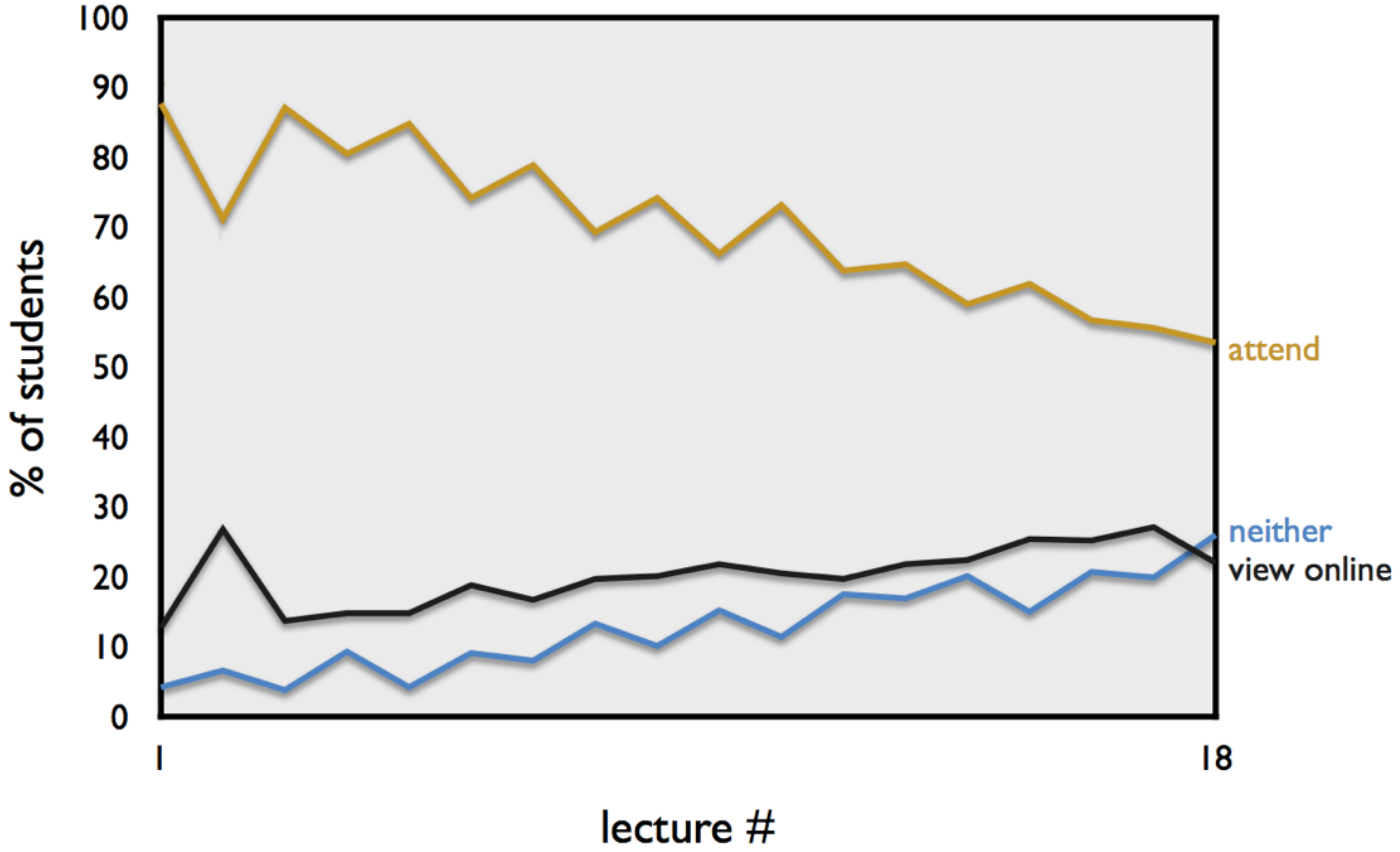
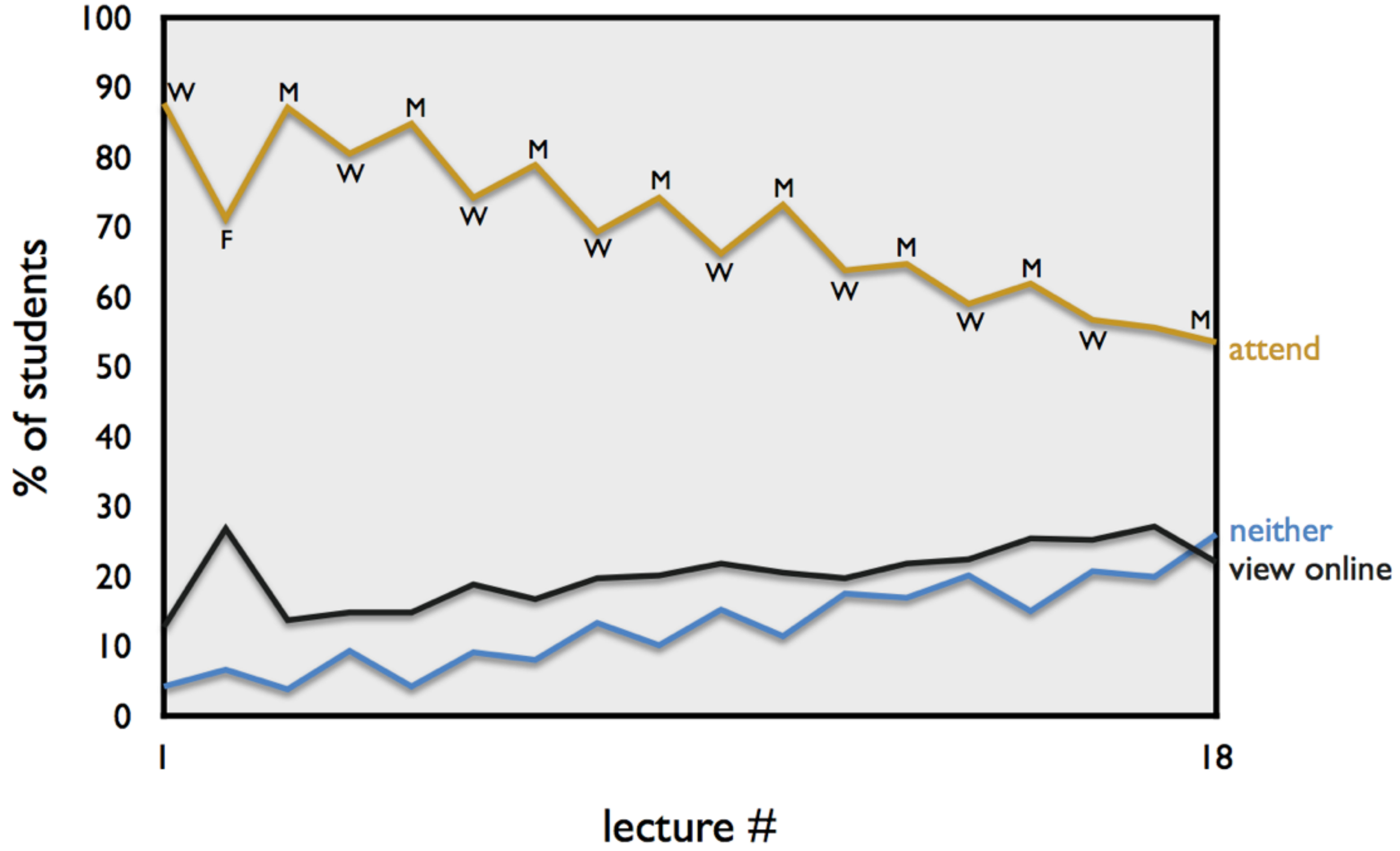
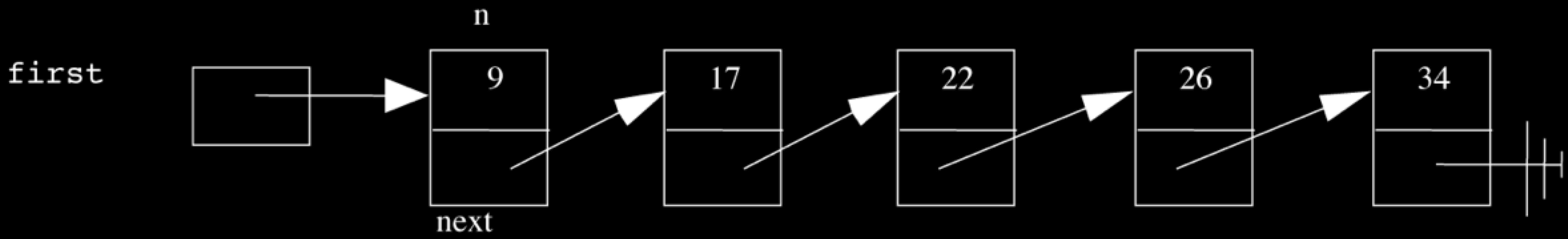
week 6


% of students
100
90
80
70
60
50
40
30
20
10
0
1
18
lecture #
attend
neither
view online



100
90
80
70
60
50
40
30
20
10
0
% of students
1
18
lecture #
W
F
M
W
M
W
M
W
M
W
M
W
M
W
M
W
M
attend
neither
view online

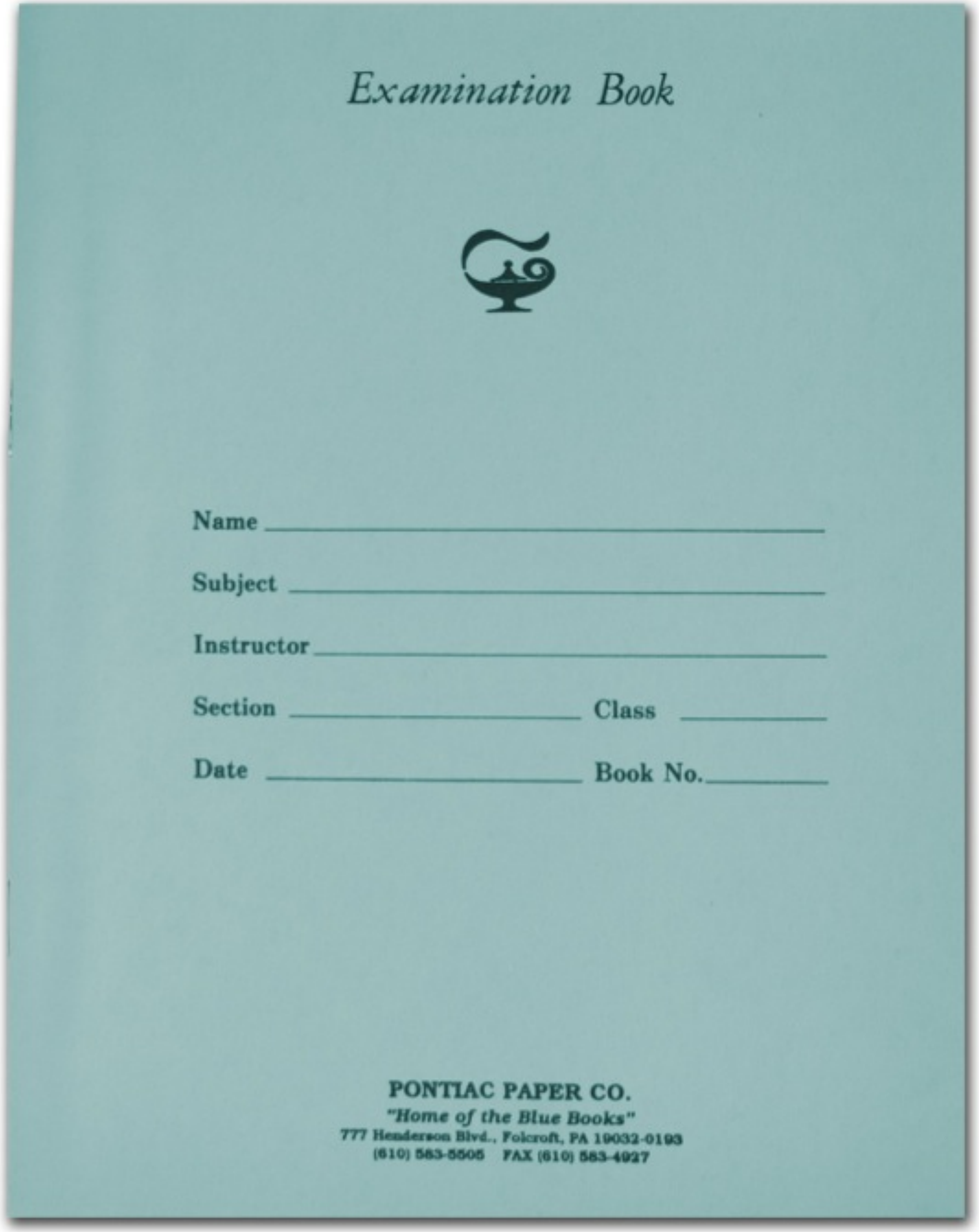


http://cs.calvin.edu/books/c++/ds/1e/

$O(n)$

$\Omega(1)$

$O(1)$



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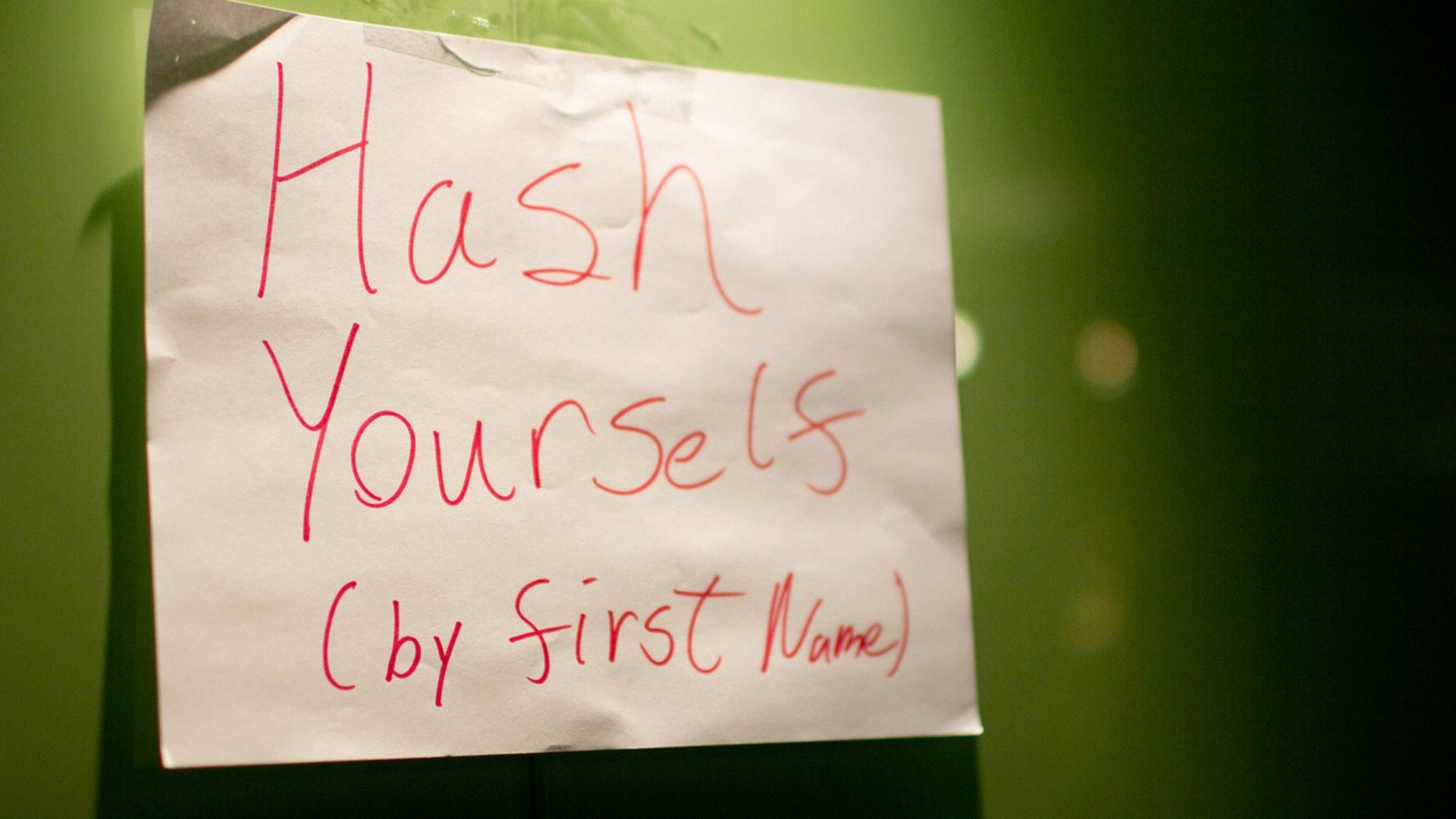
ITT
1787

PROPERTY
SCS
STAFF

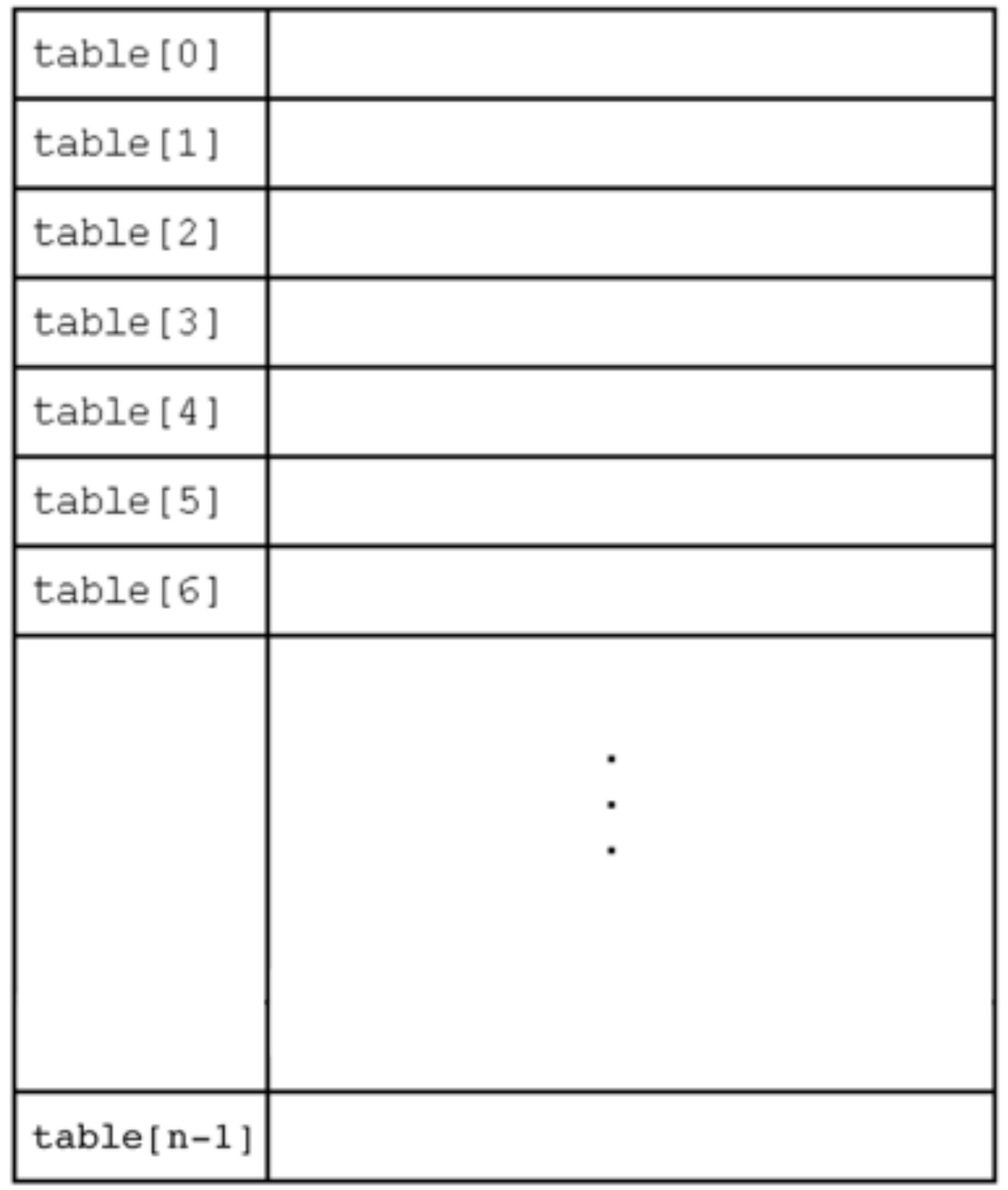

Hash Yourselfs
(by first Name)

hash table

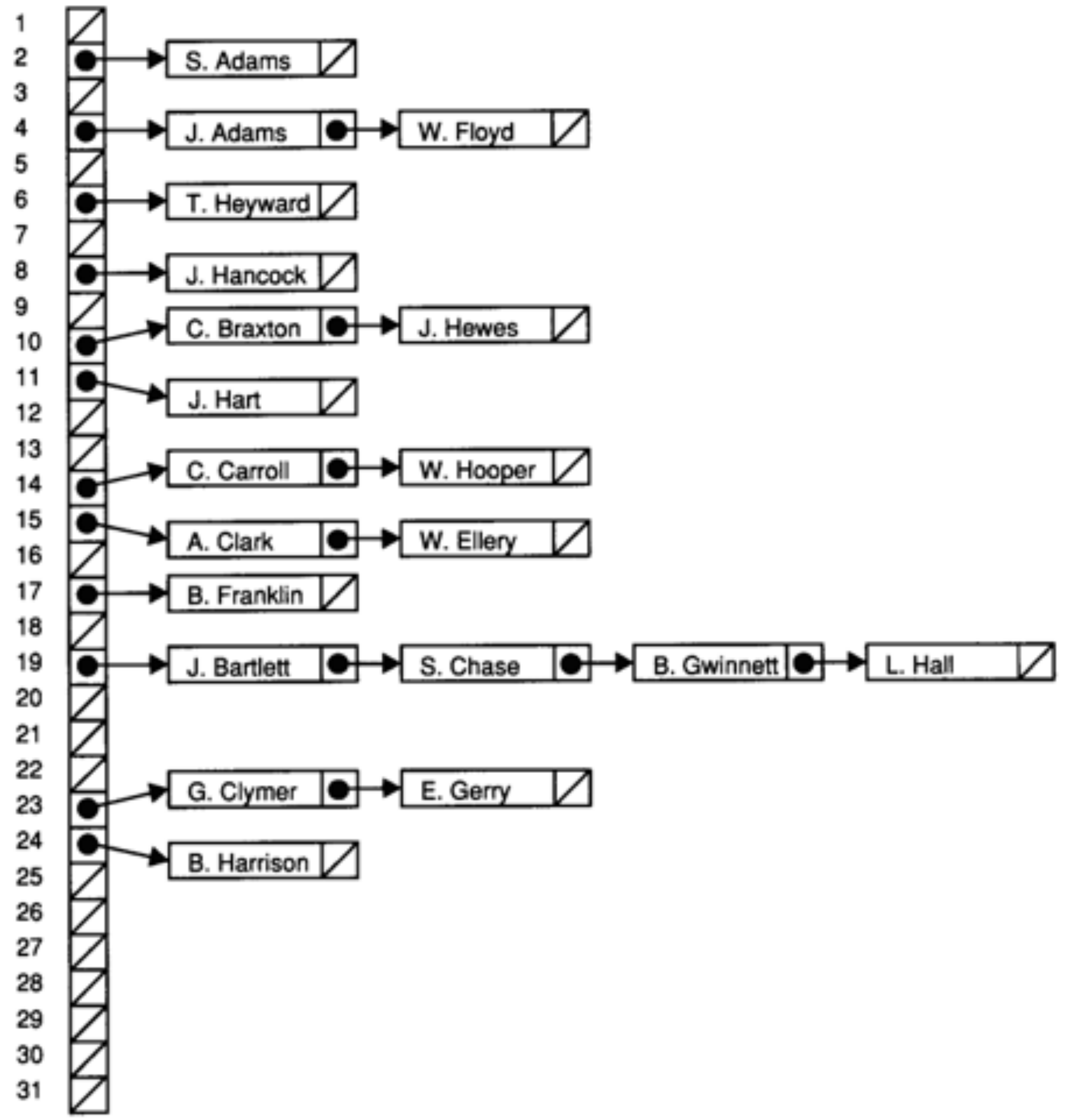
table[0]	
table[1]	
table[2]	
table[3]	
table[4]	
table[5]	
table[6]	
	⋮
table[24]	
table[25]	

```
char* table[CAPACITY];
```

linear probing



separate chaining



```
typedef struct node
{
    char* word;
    struct node* next;
}
node;
```

```c
typedef struct node
{
    char* word;
    struct node* next;
}
node;

node* table[CAPACITY];
```

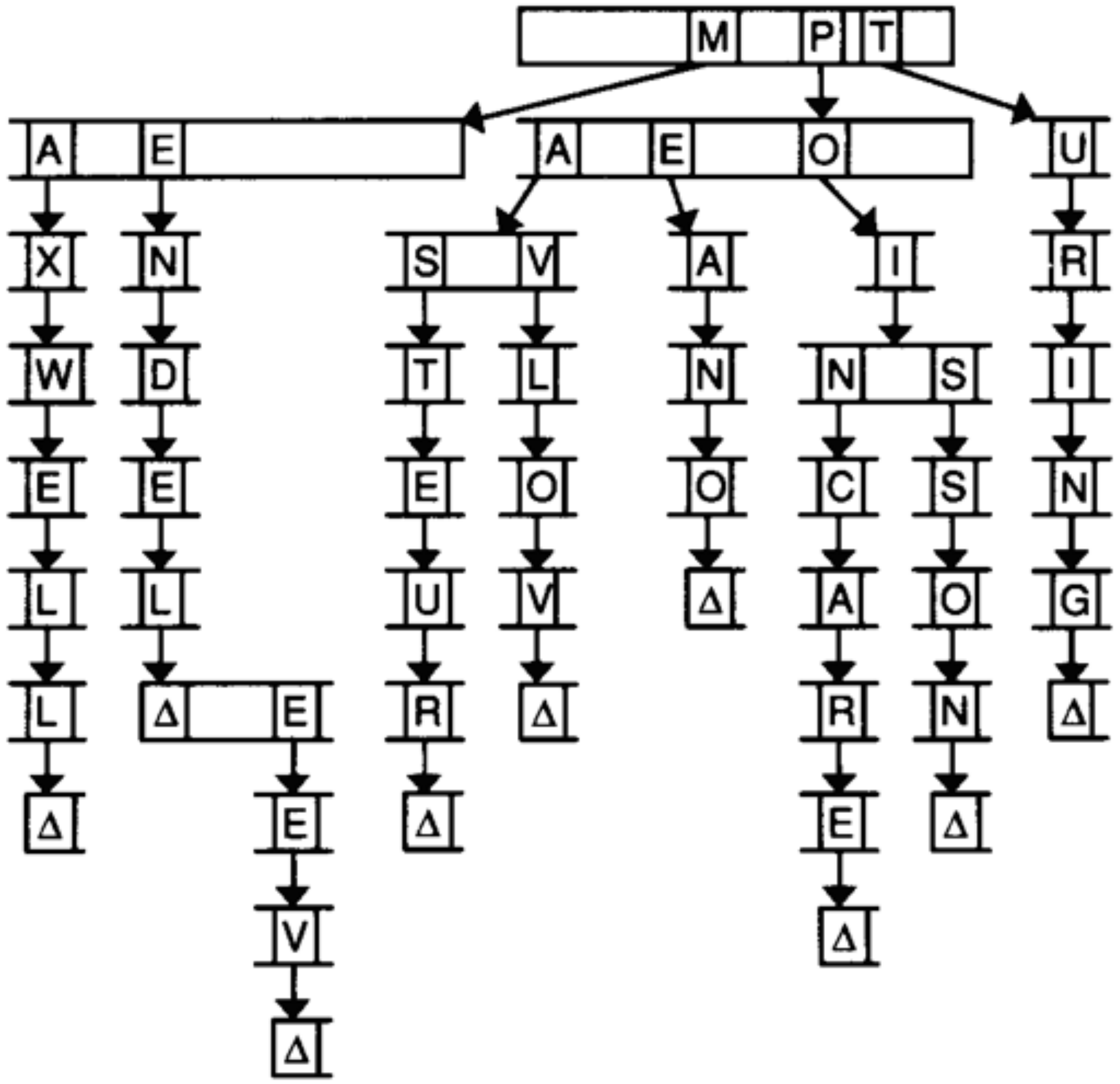


Figure from Lewis and Denenberg's Data Structures & Their Algorithms.

```
typedef struct node
{
    bool word;
    struct node* children[27];
}
node;

node* trie;
```

THANKS FOR YOUR HELP

stack

push, pop

stack

last in first out
(LIFO)

```
typedef struct node
{
    int number;
    struct node* next;
}
node;
```

```
typedef struct node
{
    int number;
    struct node* next;
}
node;

node* stack;
```

http://www.blogcdn.com/www.engadget.com/media/2008/05/iphone_line_1-1.jpg

queue

enqueue, dequeue

queue

first in first out
(FIFO)

tree

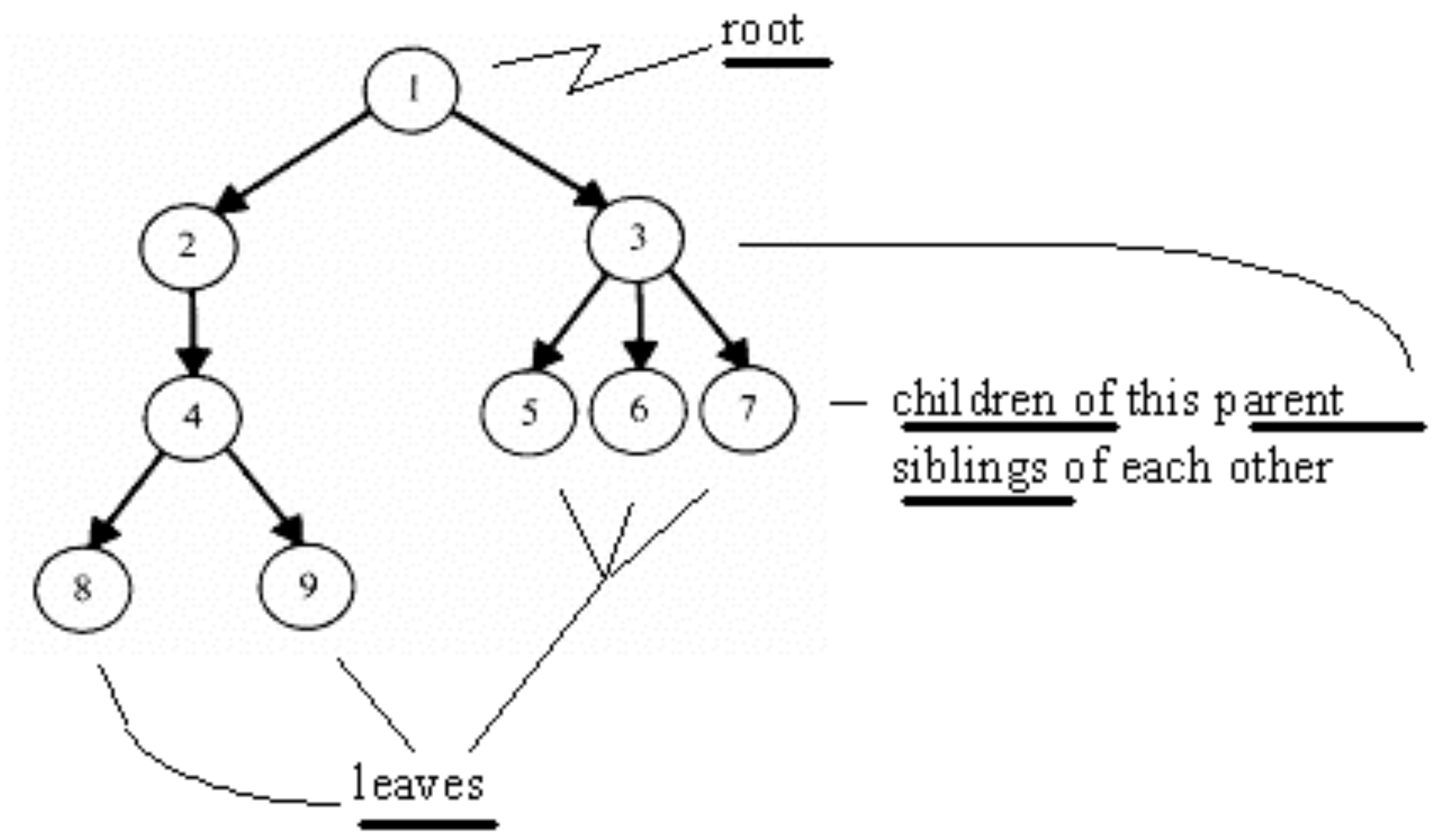


Figure by Larry Nyhoff.

binary search tree

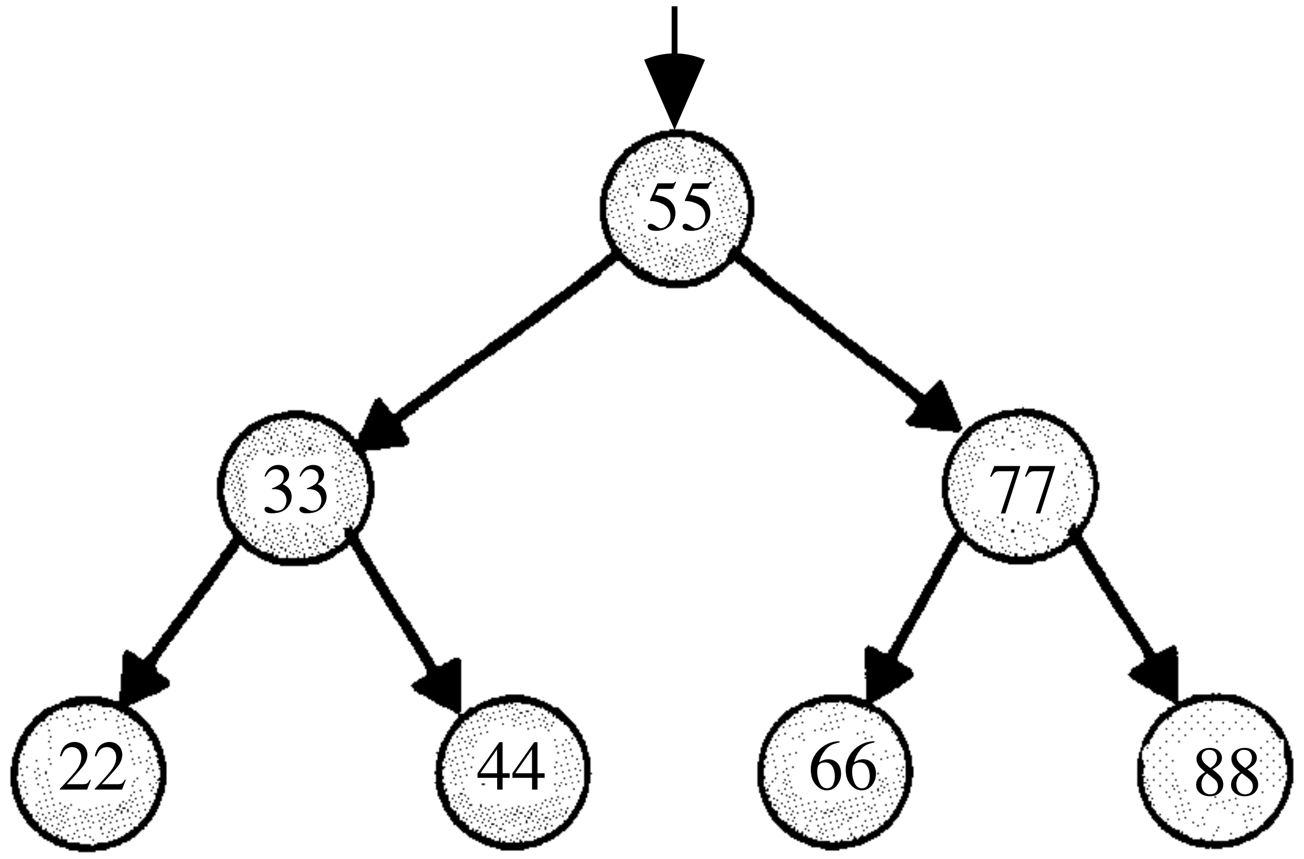
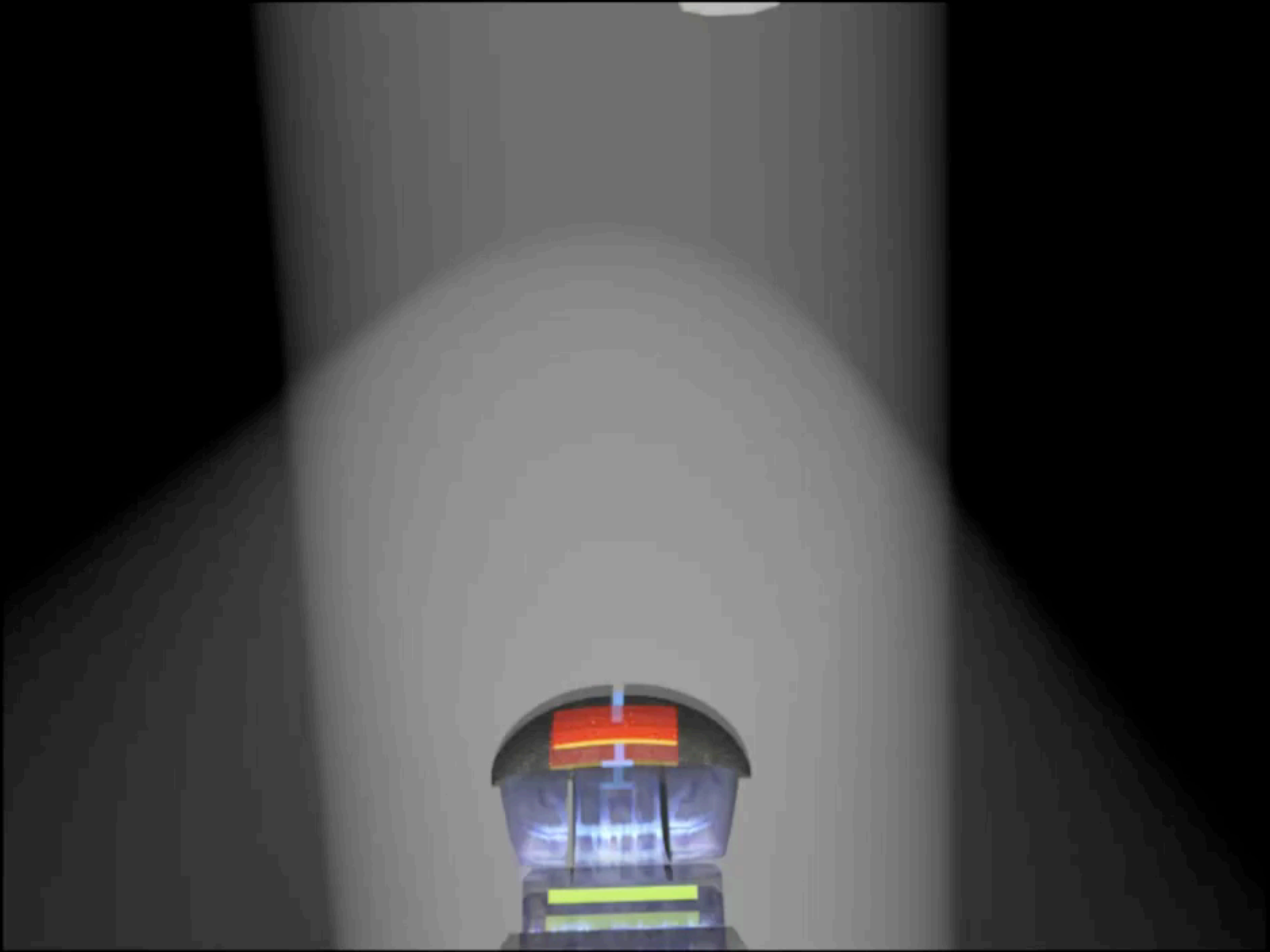


Figure from http://cs.calvin.edu/books/c++/ds/1e/.

```
typedef struct node
{
    int n;
    struct node* left;
    struct node* right;
}
node;
```

```
bool search(int n, node* tree)
{
    if (tree == NULL)
    {
        return false;
    }
    else if (n < tree->n)
    {
        return search(n, tree->left);
    }
    else if (n > tree->n)
    {
        return search(n, tree->right);
    }
    else
    {
        return true;
    }
}
```



to be continued...