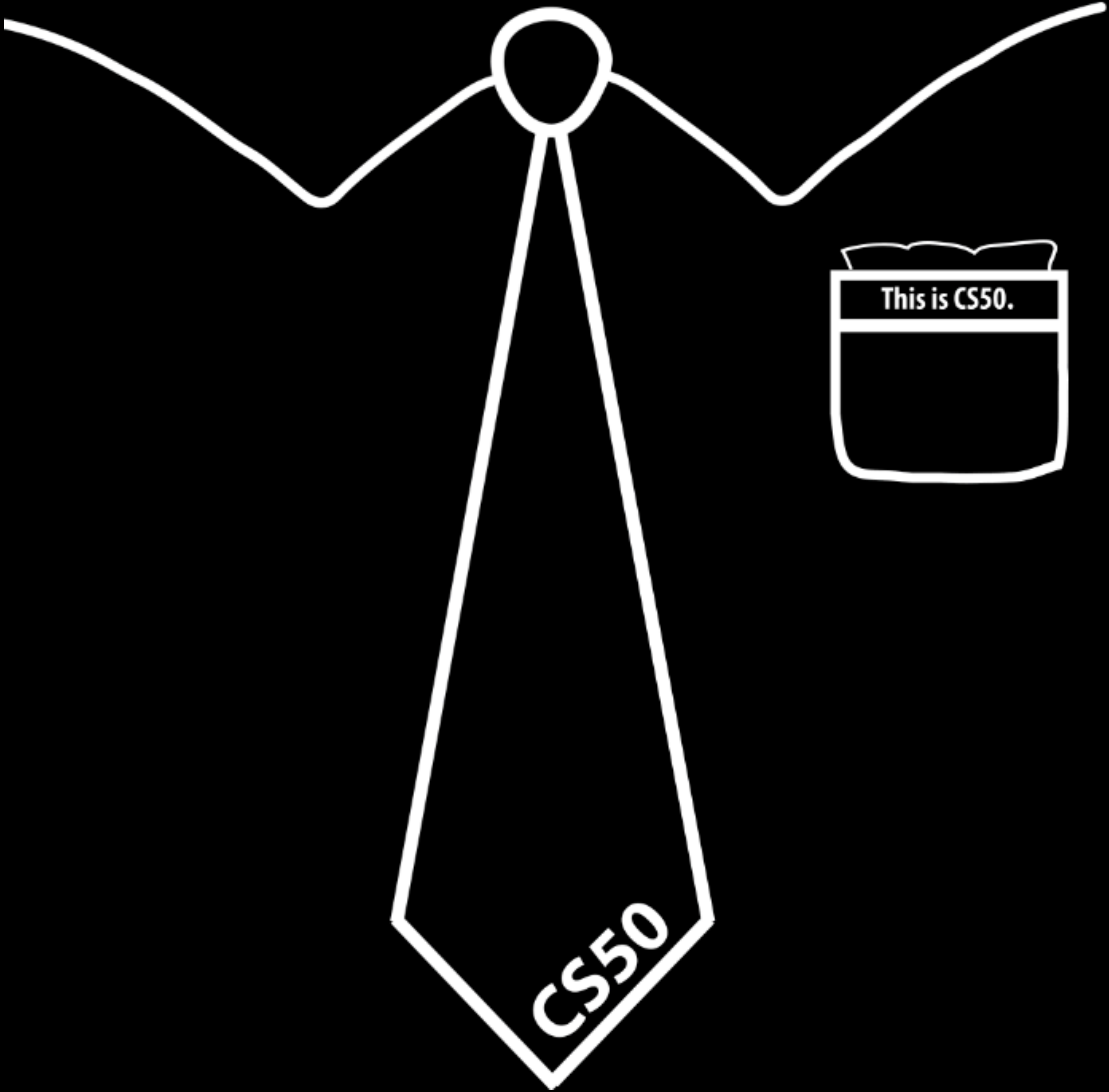
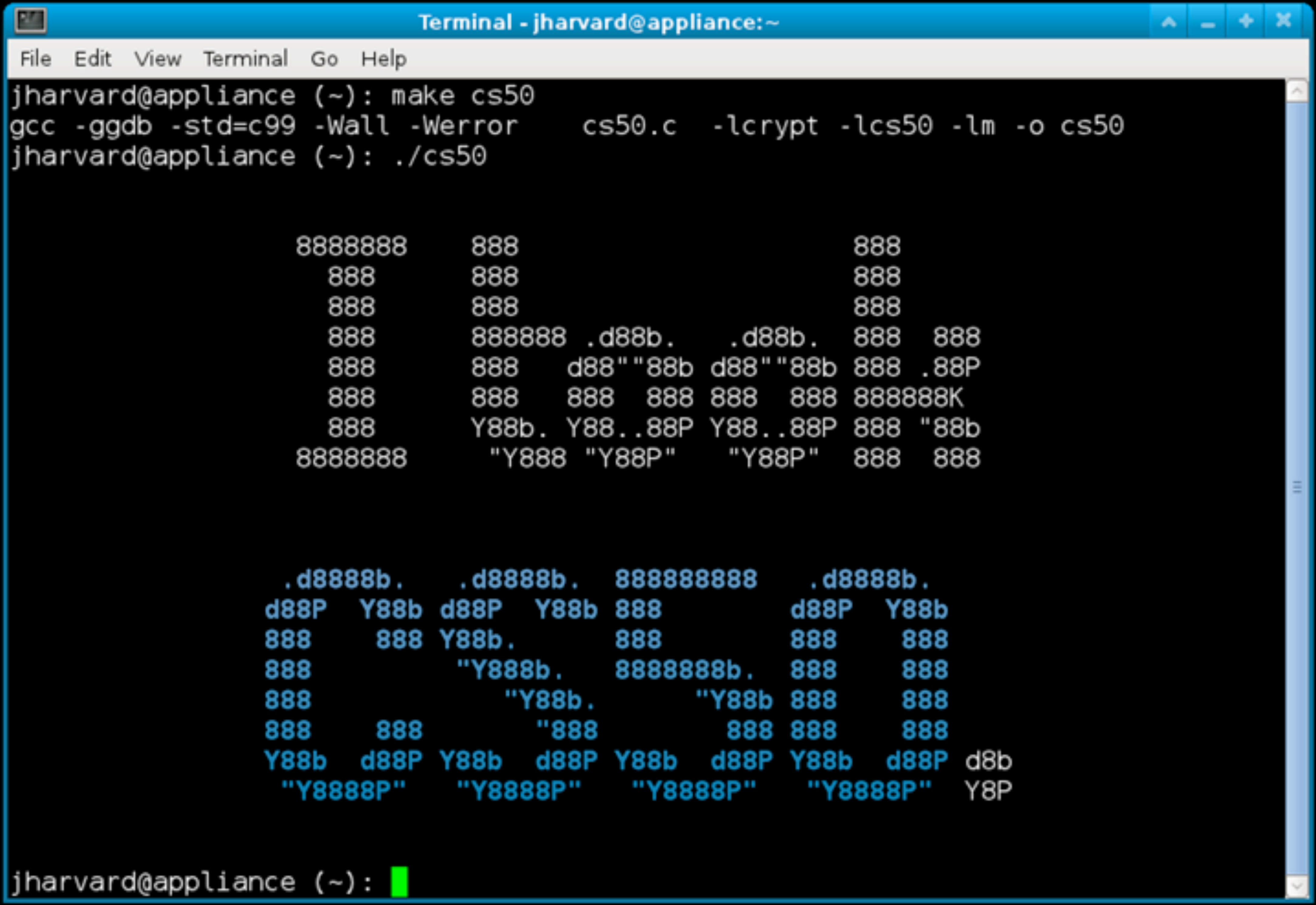
proof of concept.
ansel duff

store.cs50.net


This is CS50.
CS50

n00b

l33t



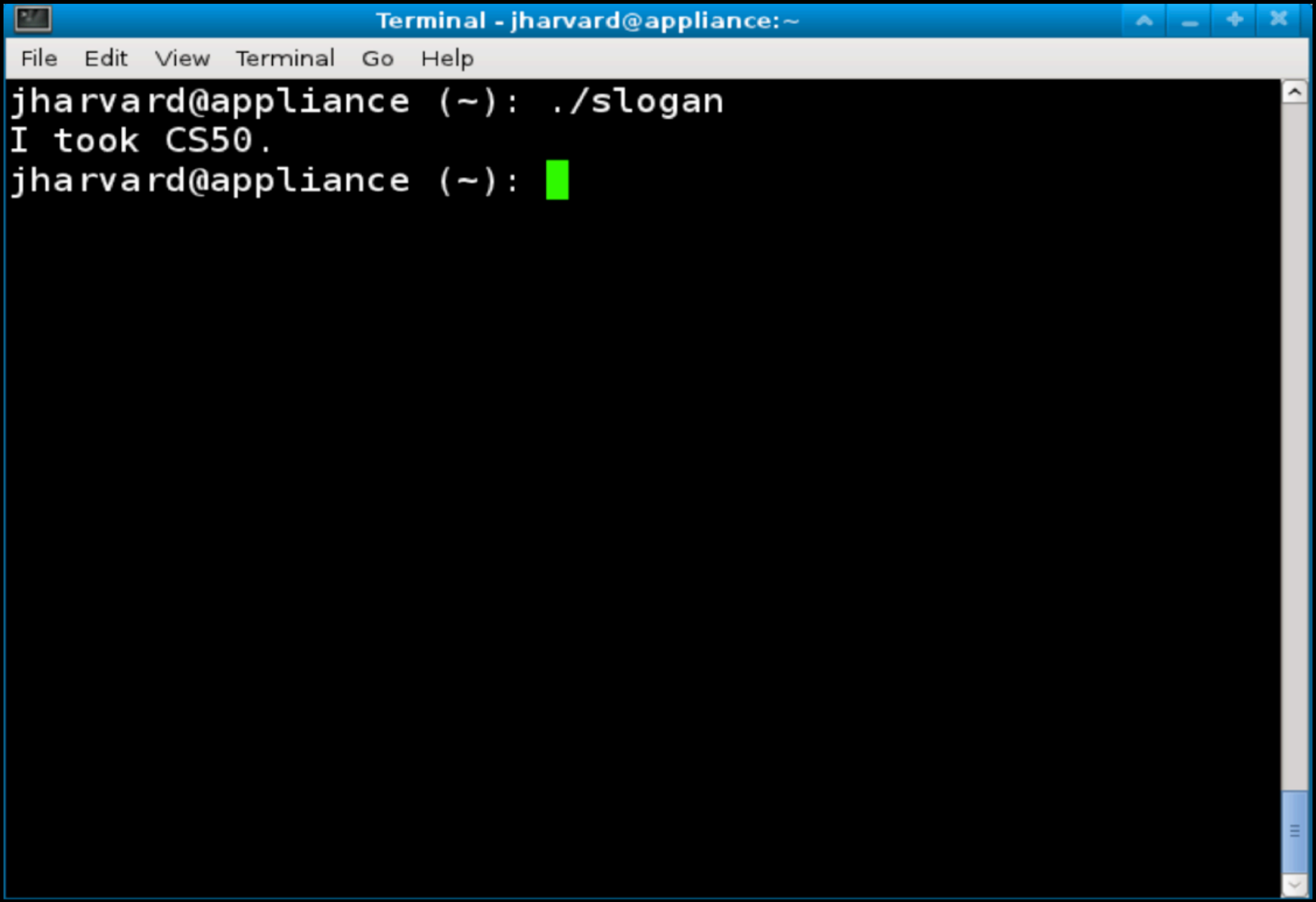
```
jharvard@appliance (~): make cs50
gcc -ggdb -std=c99 -Wall -Werror    cs50.c  -lcrypt -lcs50 -lm -o cs50
jharvard@appliance (~): ./cs50


                  8888888    888                     888
                    888      888                     888
                    888      888                     888
                    888      888888 .d88b.   .d88b.  888  888
                    888      888   d88""88b d88""88b 888 .88P
                    888      888   888  888 888  888 888888K
                    888      Y88b. Y88..88P Y88..88P 888 "88b
                  8888888     "Y888 "Y88P"   "Y88P"  888  888



                 .d8888b.   .d8888b.  888888888   .d8888b.
                d88P  Y88b d88P  Y88b 888        d88P  Y88b
                888    888 Y88b.      888        888    888
                888         "Y888b.   8888888b.  888    888
                888            "Y88b.      "Y88b 888    888
                888    888       "888        888 888    888
                Y88b  d88P Y88b  d88P Y88b  d88P Y88b  d88P d8b
                 "Y8888P"   "Y8888P"   "Y8888P"   "Y8888P"  Y8P


jharvard@appliance (~): 
```

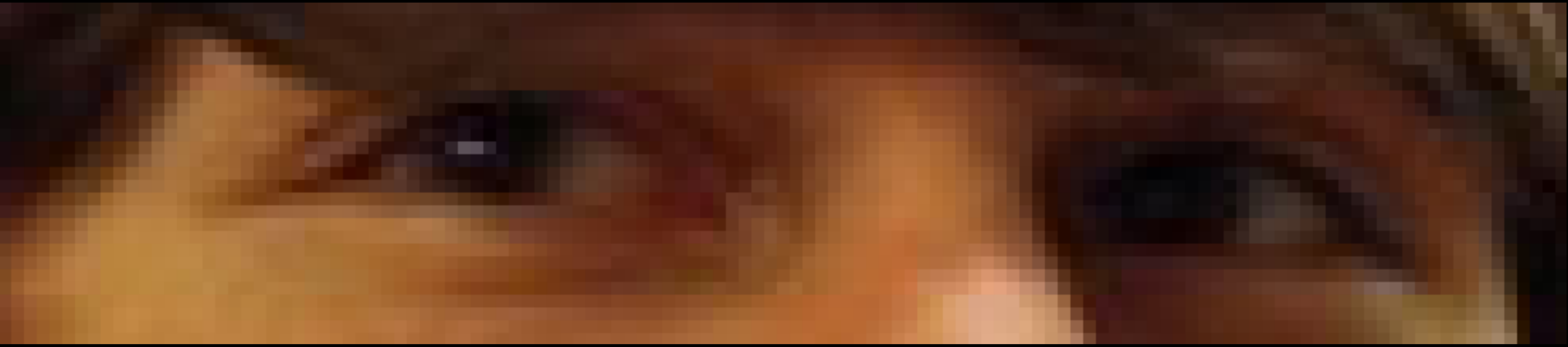


```
jharvard@appliance (~): ./slogan
I took CS50.
jharvard@appliance (~): 
```

Bowden Fever

Team Bowden

I saw you...



CS50 Lunch

cs50.net/rsvp

SILVERWARE
PLATES ON A TRAY
INTO
ROOM TO PREVENT
EQUIPMENT PROBLEMS
THANKS FOR YOUR HELP
IS THE #1 WAY

```
typedef struct
{
    int numbers[CAPACITY];
    int size;
}
stack;
```

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

```
typedef struct
{
    int head;
    int numbers[CAPACITY];
    int size;
}
queue;
```

hash table

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

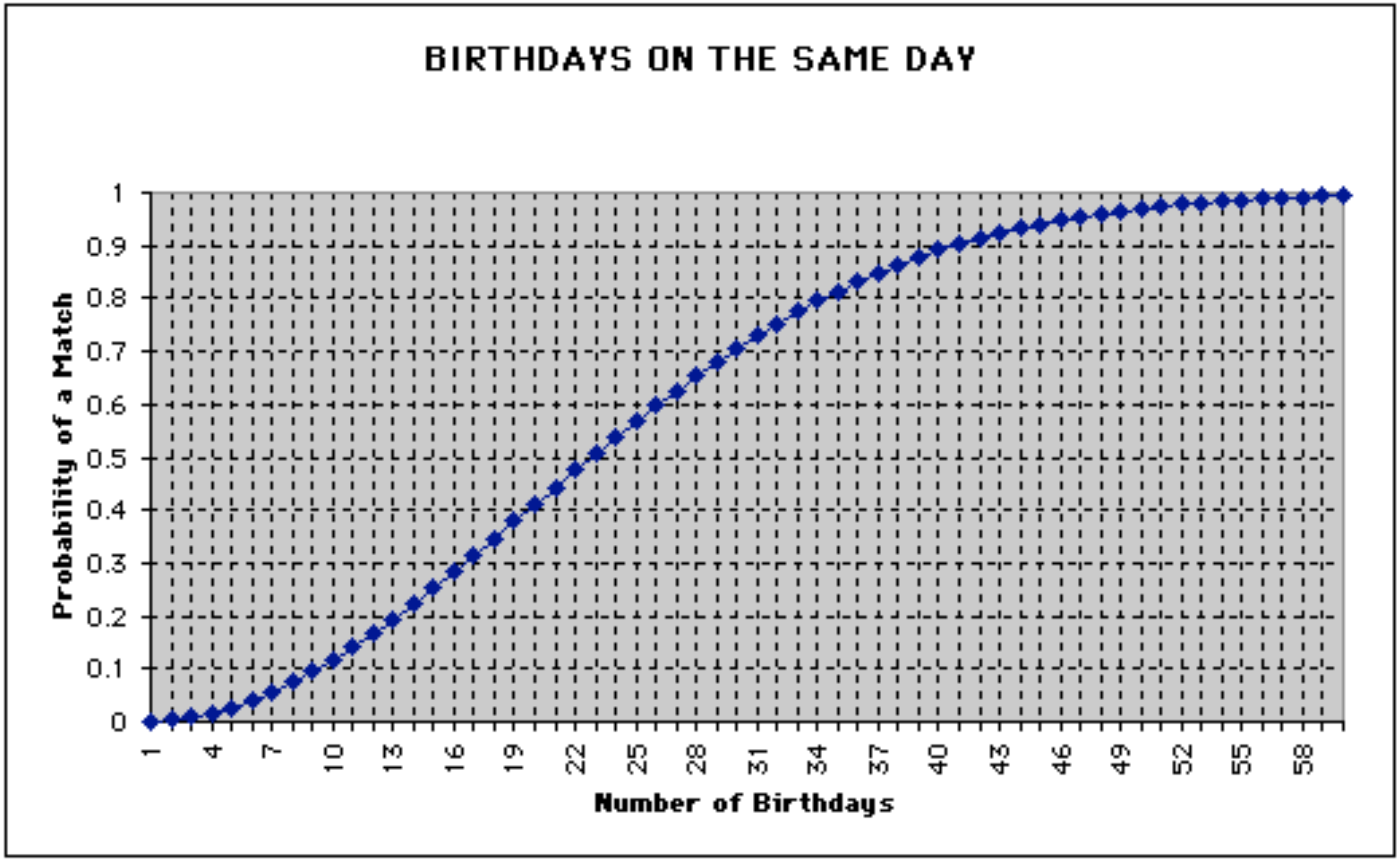
In a room of *n* CS50 students, what's the probability that at least 2 students have the same birthday?

$$\bar{p}(n) = 1\cdot\left(1-\frac{1}{365}\right)\cdot\left(1-\frac{2}{365}\right)\cdots\left(1-\frac{n-1}{365}\right)$$

http://en.wikipedia.org/wiki/Birthday_paradox

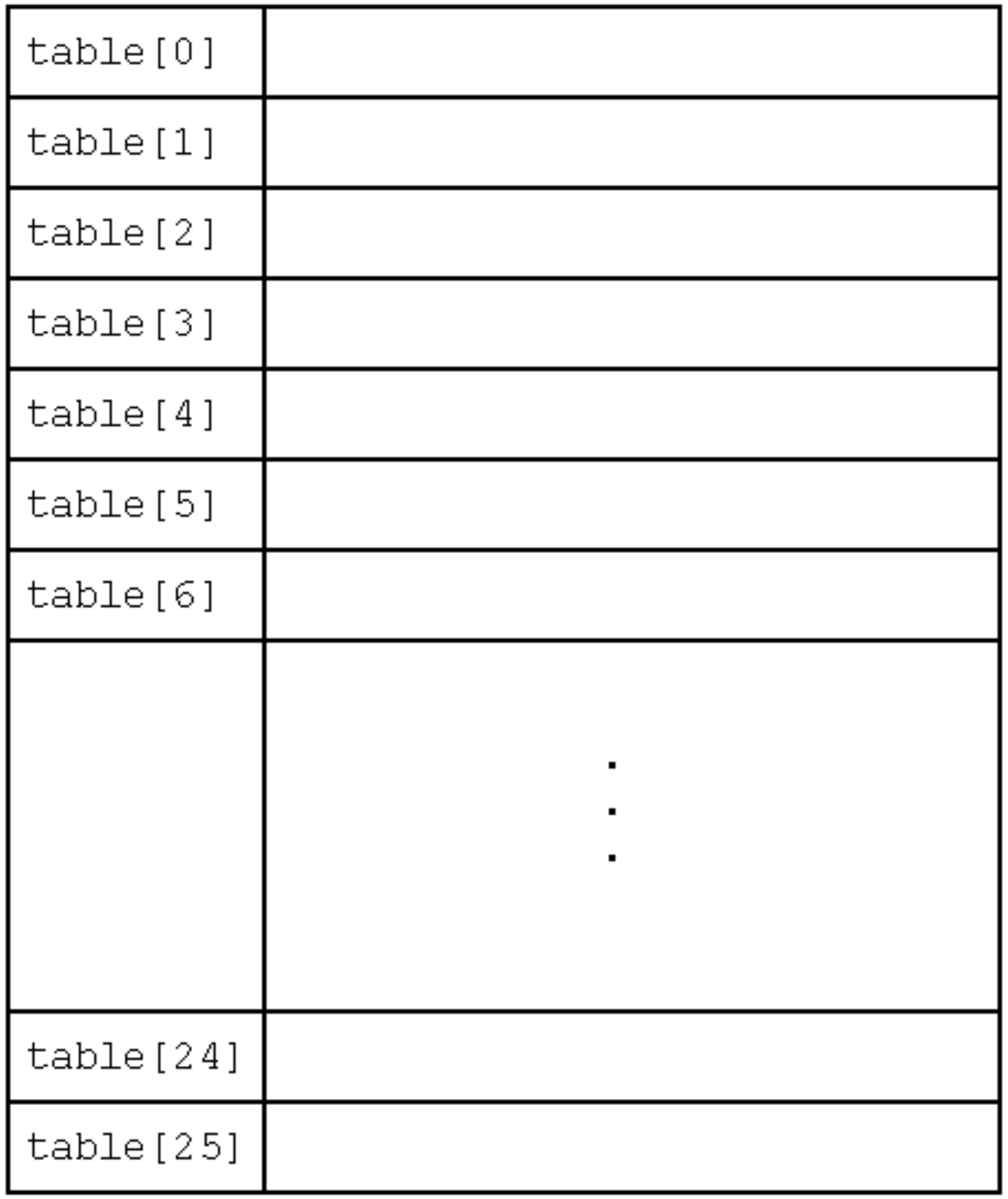
$$= \frac{365!}{365^n(365-n)!}$$

http://en.wikipedia.org/wiki/Birthday_paradox



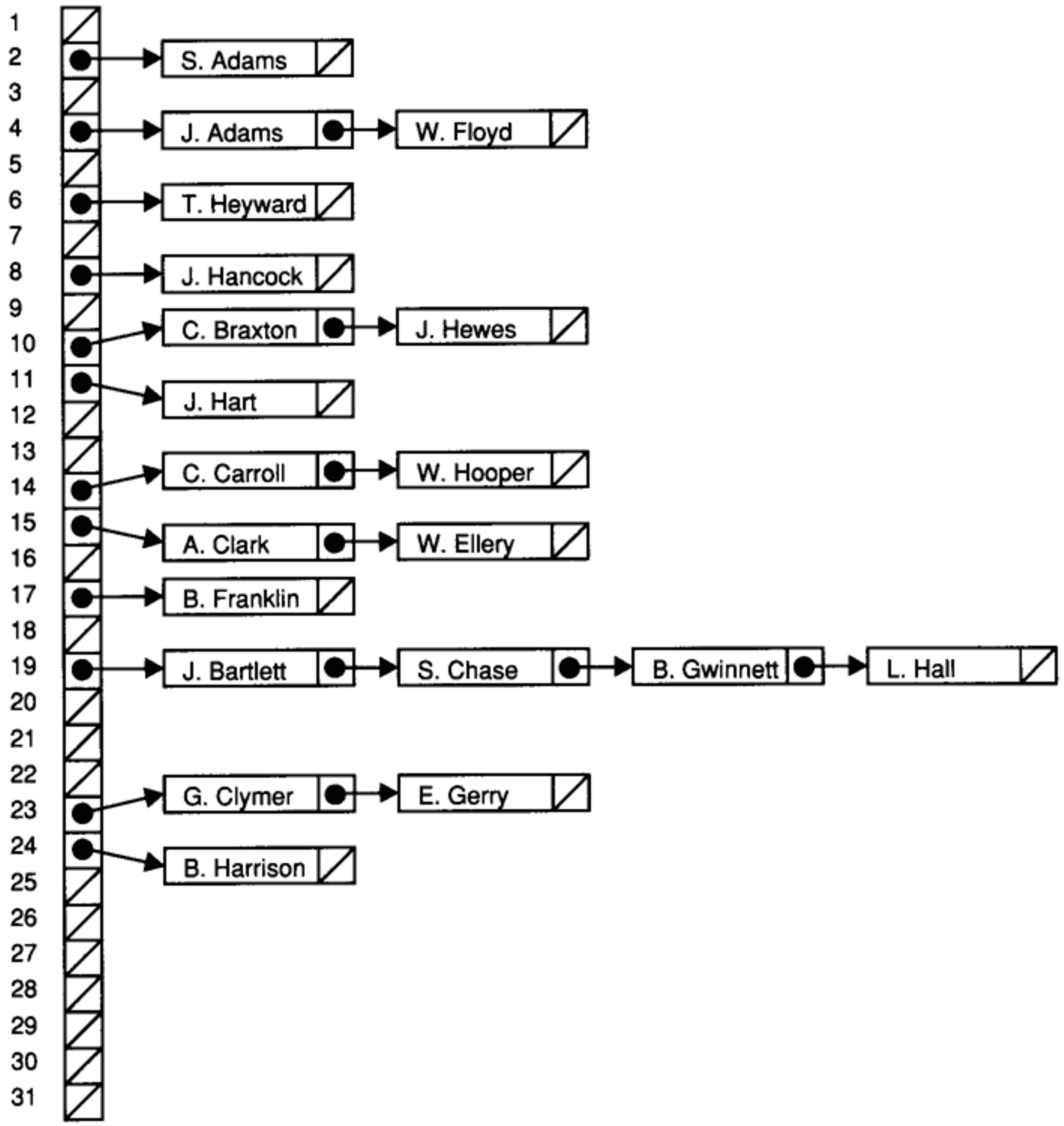
http://www.mste.uiuc.edu/reese/birthday/probchart.GIF

linear probing



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

separate chaining



```
typedef struct node
{
    char word[LENGTH + 1];
    struct node *next;
}
node;
```

tree

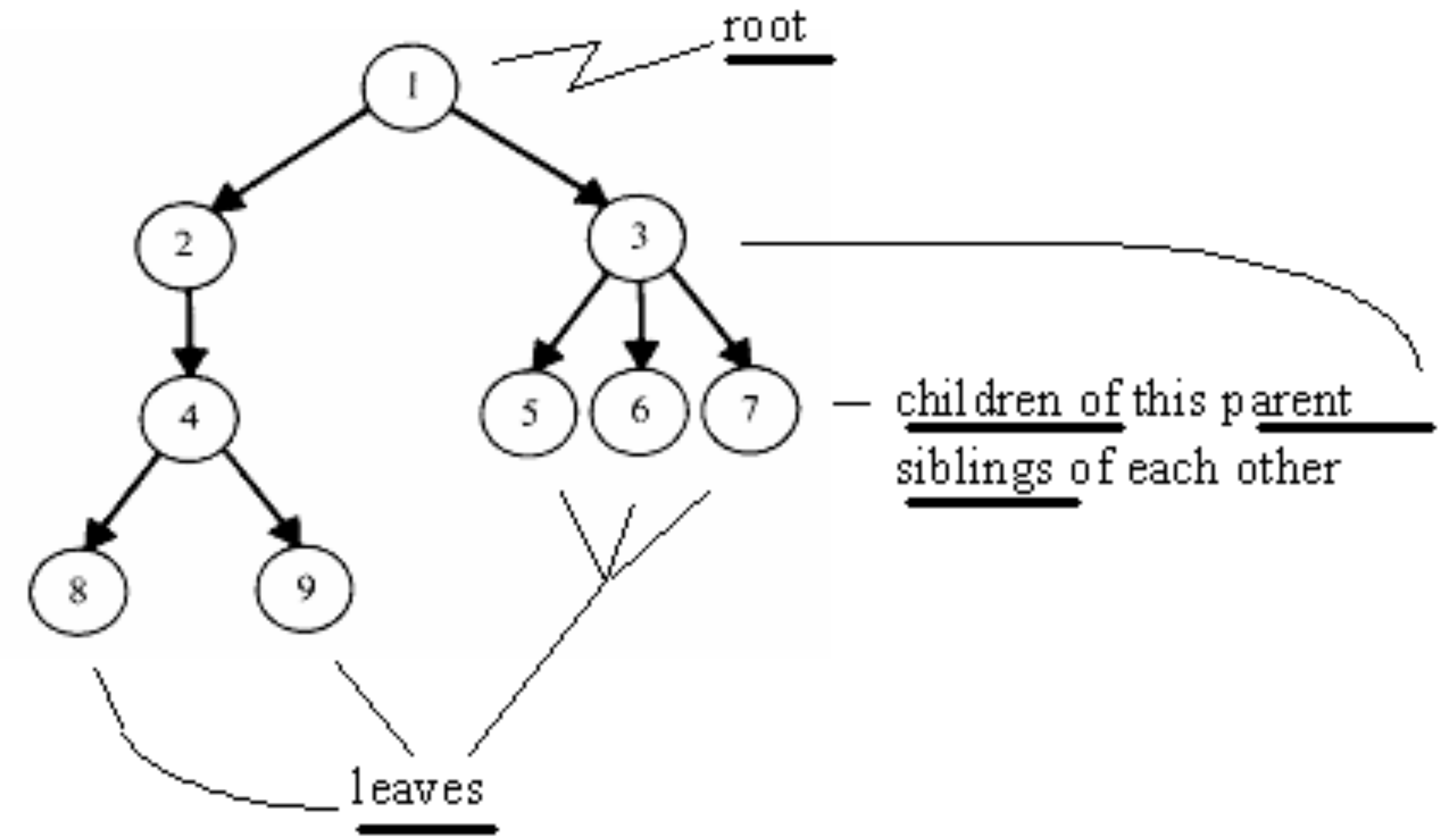


Figure by Larry Nyhoff.

binary search tree

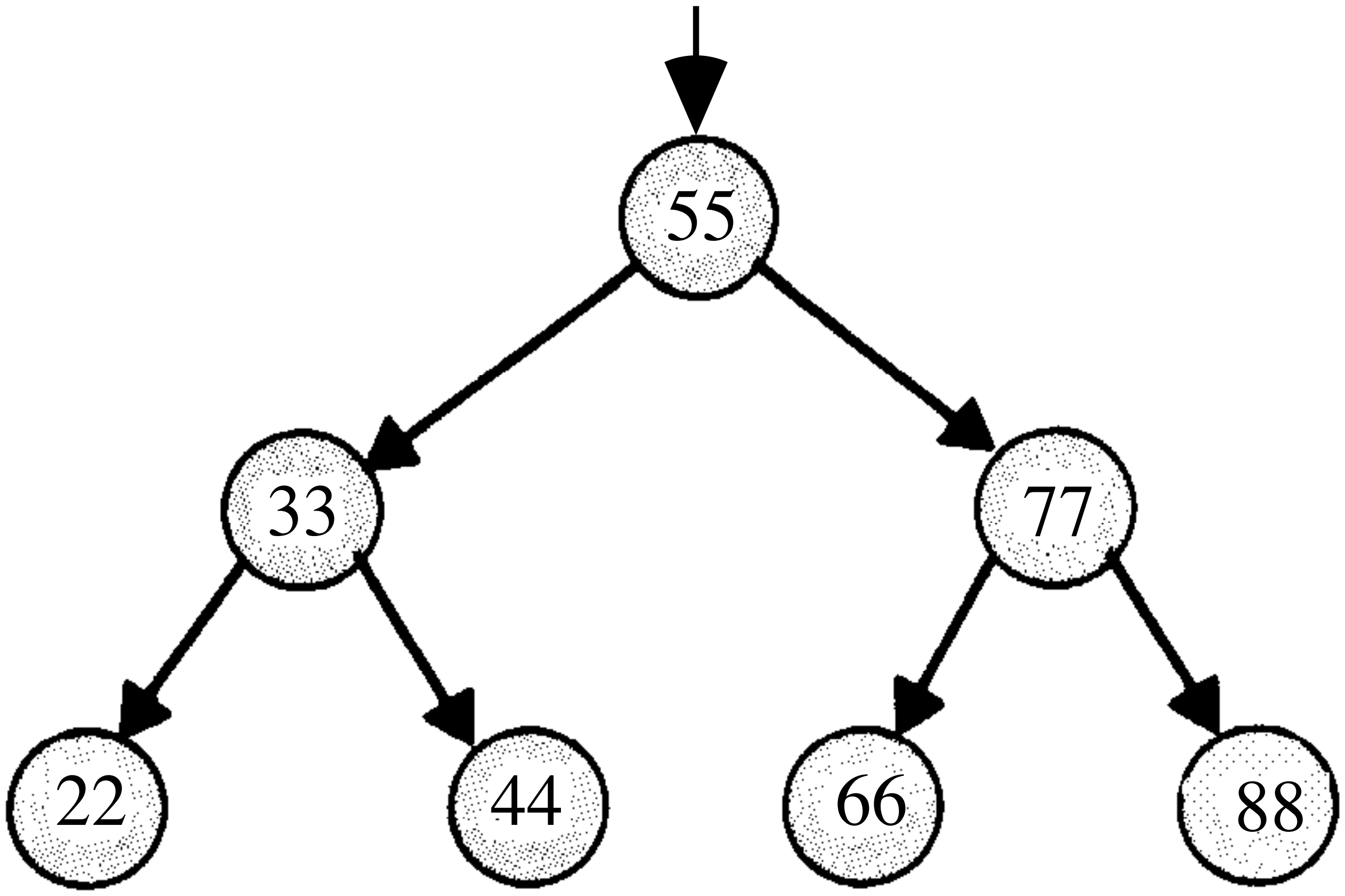


Figure from http://cs.calvin.edu/books/c++/ds/1e/.

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

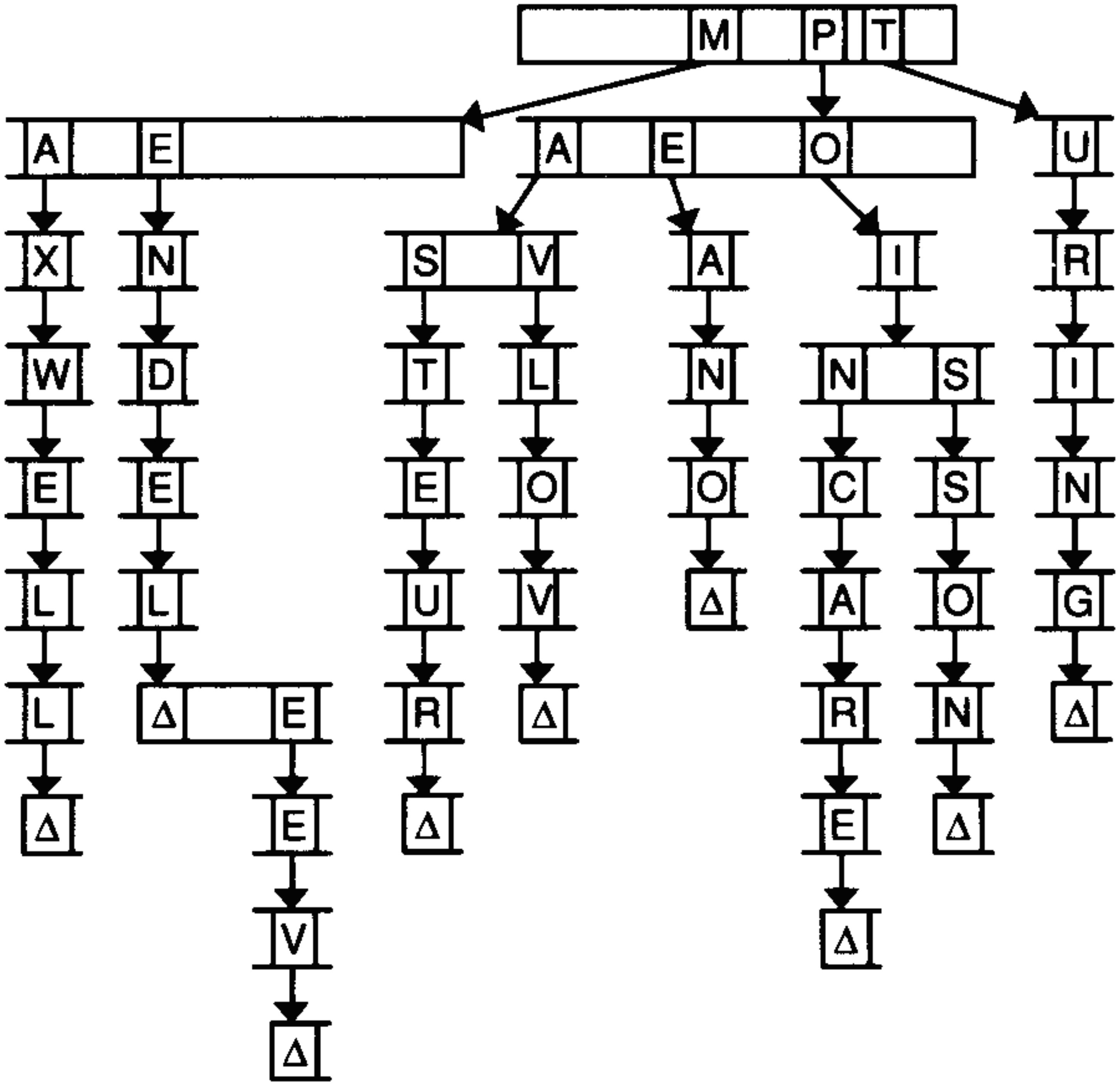
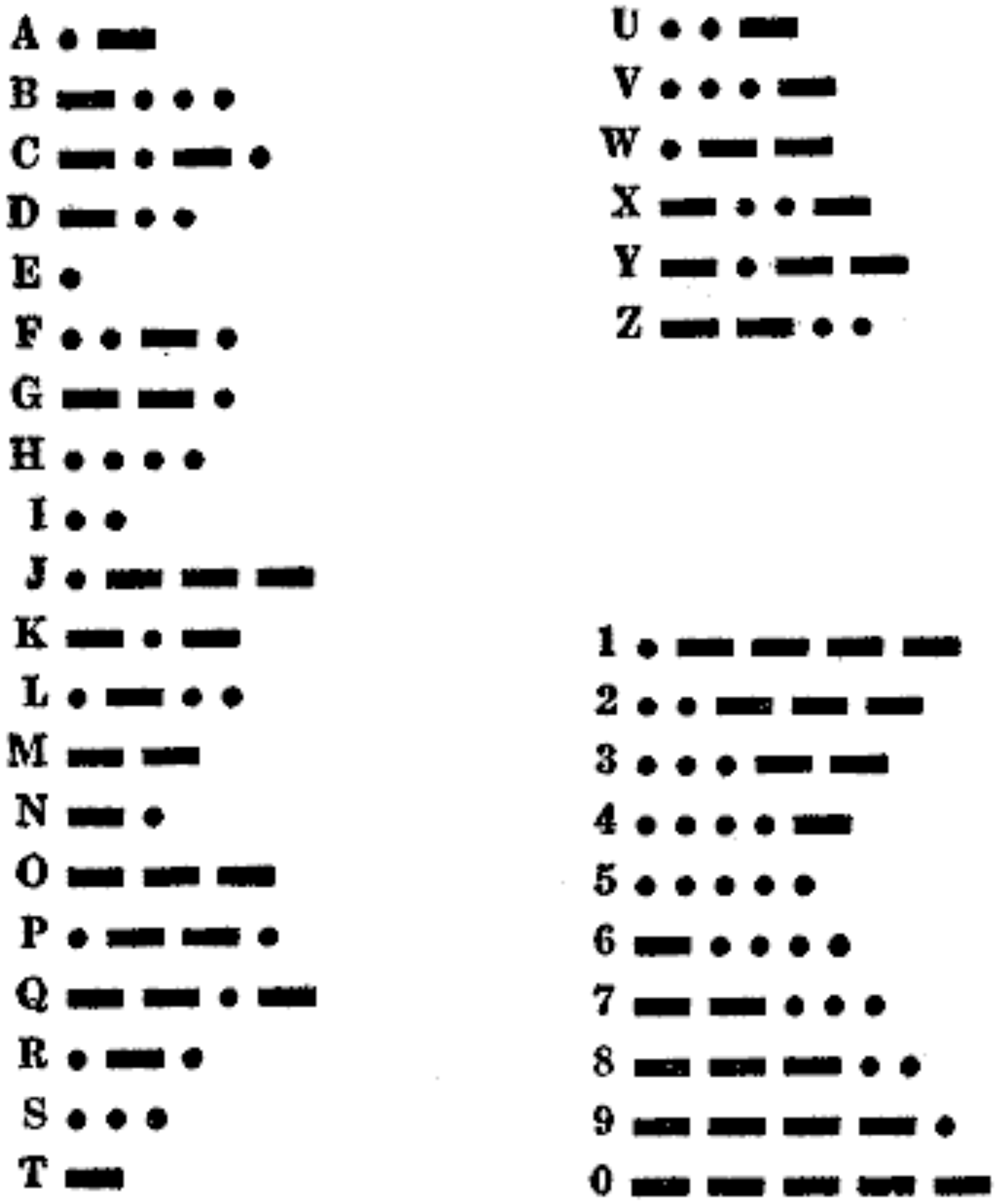


Figure from Lewis and Denenberg's Data Structures & Their Algorithms.

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

morse code



A	• ▬
B	▬ • • •
C	▬ • ▬ •
D	▬ • •
E	•
F	• • ▬ •
G	▬ ▬ •
H	• • • •
I	• •
J	• ▬ ▬ ▬
K	▬ • ▬
L	• ▬ • •
M	▬ ▬
N	▬ •
O	▬ ▬ ▬
P	• ▬ ▬ •
Q	▬ ▬ • ▬
R	• ▬ •
S	• • •
T	▬
U	• • ▬
V	• • • ▬
W	• ▬ ▬
X	▬ • • ▬
Y	▬ • ▬ ▬
Z	▬ ▬ • •
1	• ▬ ▬ ▬ ▬
2	• • ▬ ▬ ▬
3	• • • ▬ ▬
4	• • • • ▬
5	• • • • •
6	▬ • • • •
7	▬ ▬ • • •
8	▬ ▬ ▬ • •
9	▬ ▬ ▬ ▬ •
0	▬ ▬ ▬ ▬ ▬

Image adapted from Wikipedia.

“ECEABEADCAEDEEEECEADEEEEEDBAAEABDBBAAEAAAC
DDCCEABEEDCBEEDEAEEEEEAEEDBCEBEEADEAEEDAEBC
DEDEAEEDCEEAEEE”

character	**A**	**B**	**C**	**D**	**E**
frequency	0.2	0.1	0.1	0.15	0.45

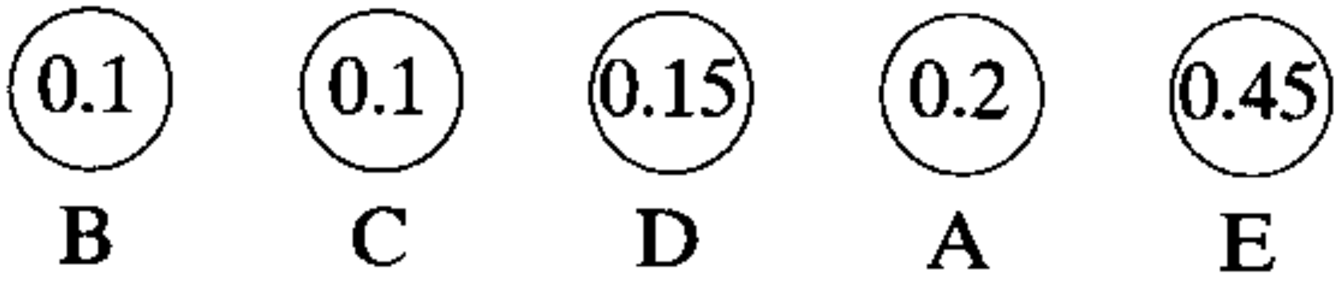


Figure by Larry Nyhoff.

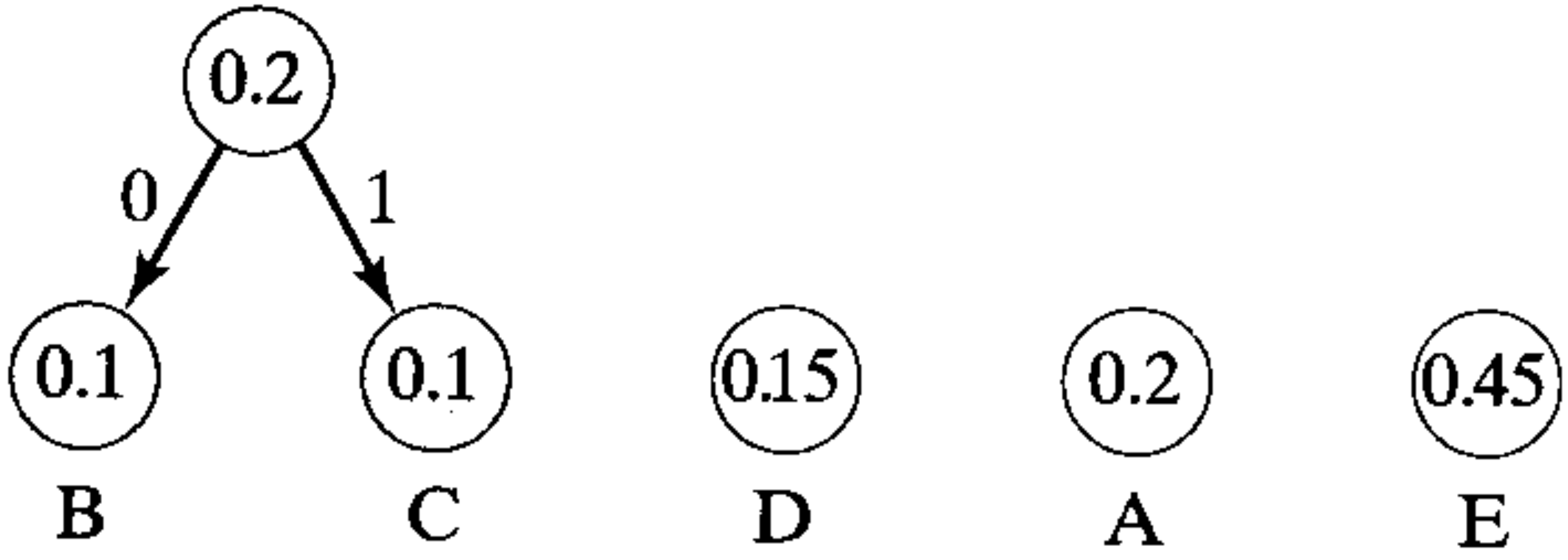


Figure by Larry Nyhoff.

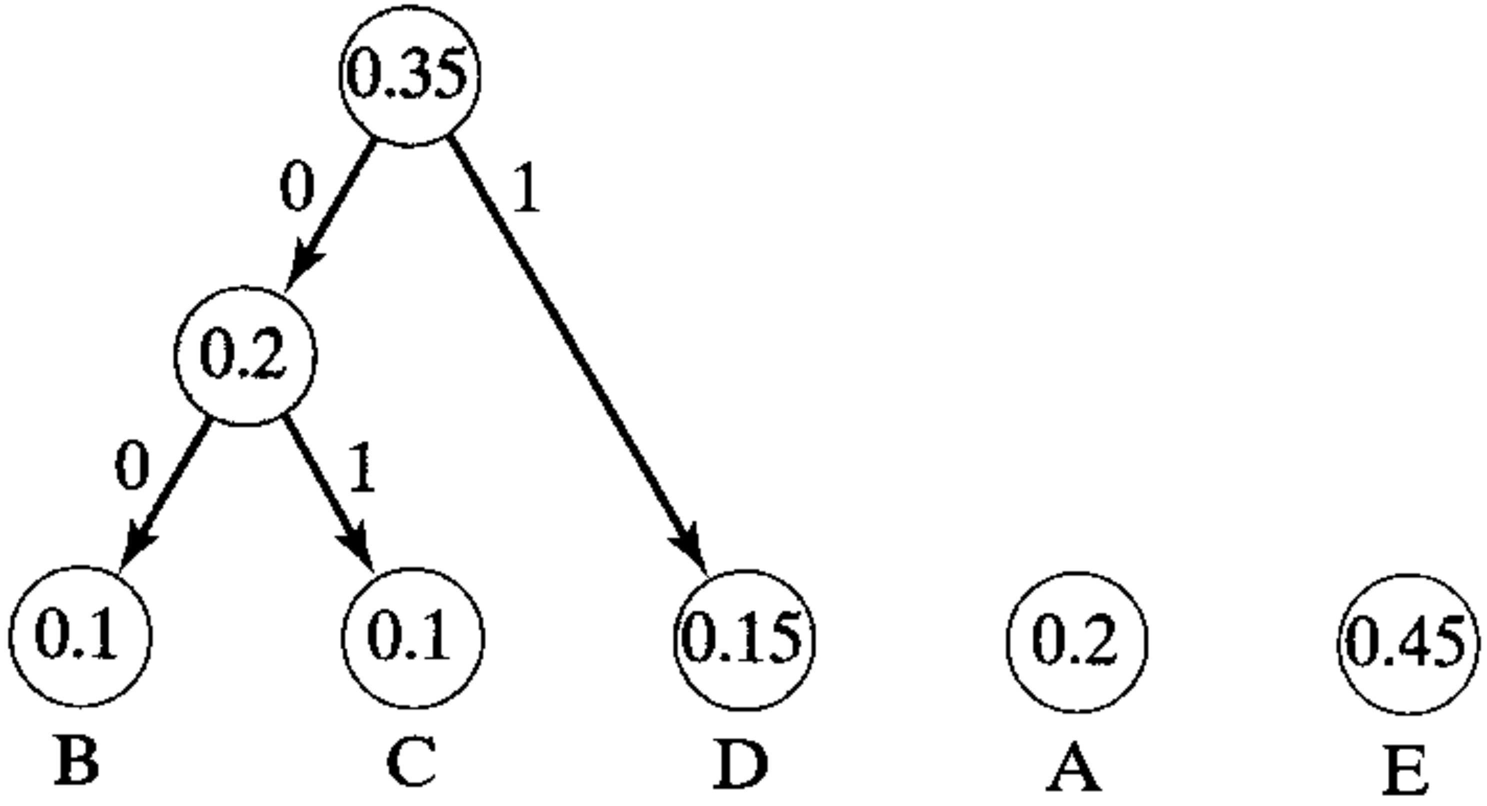


Figure by Larry Nyhoff.

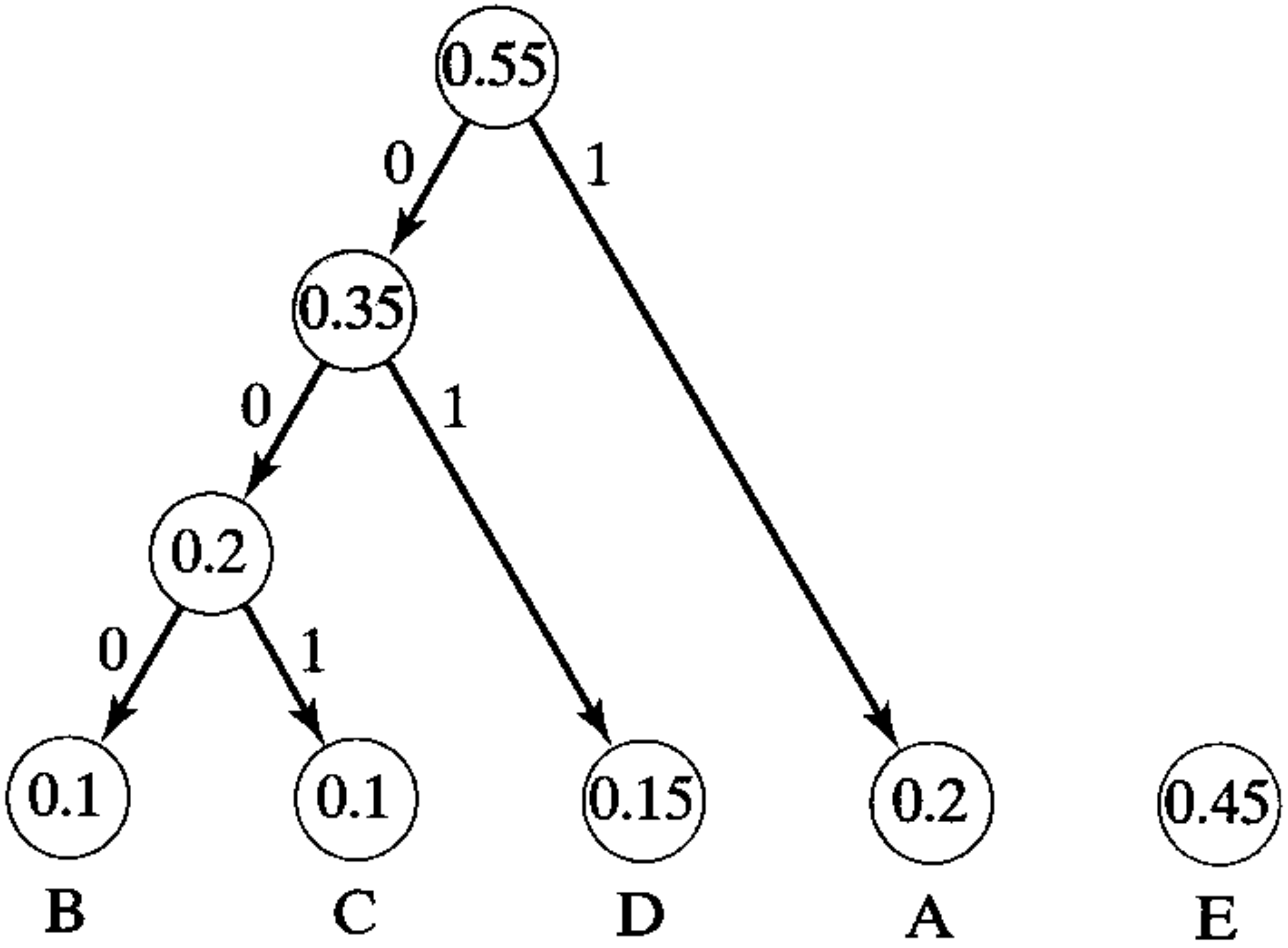


Figure by Larry Nyhoff.

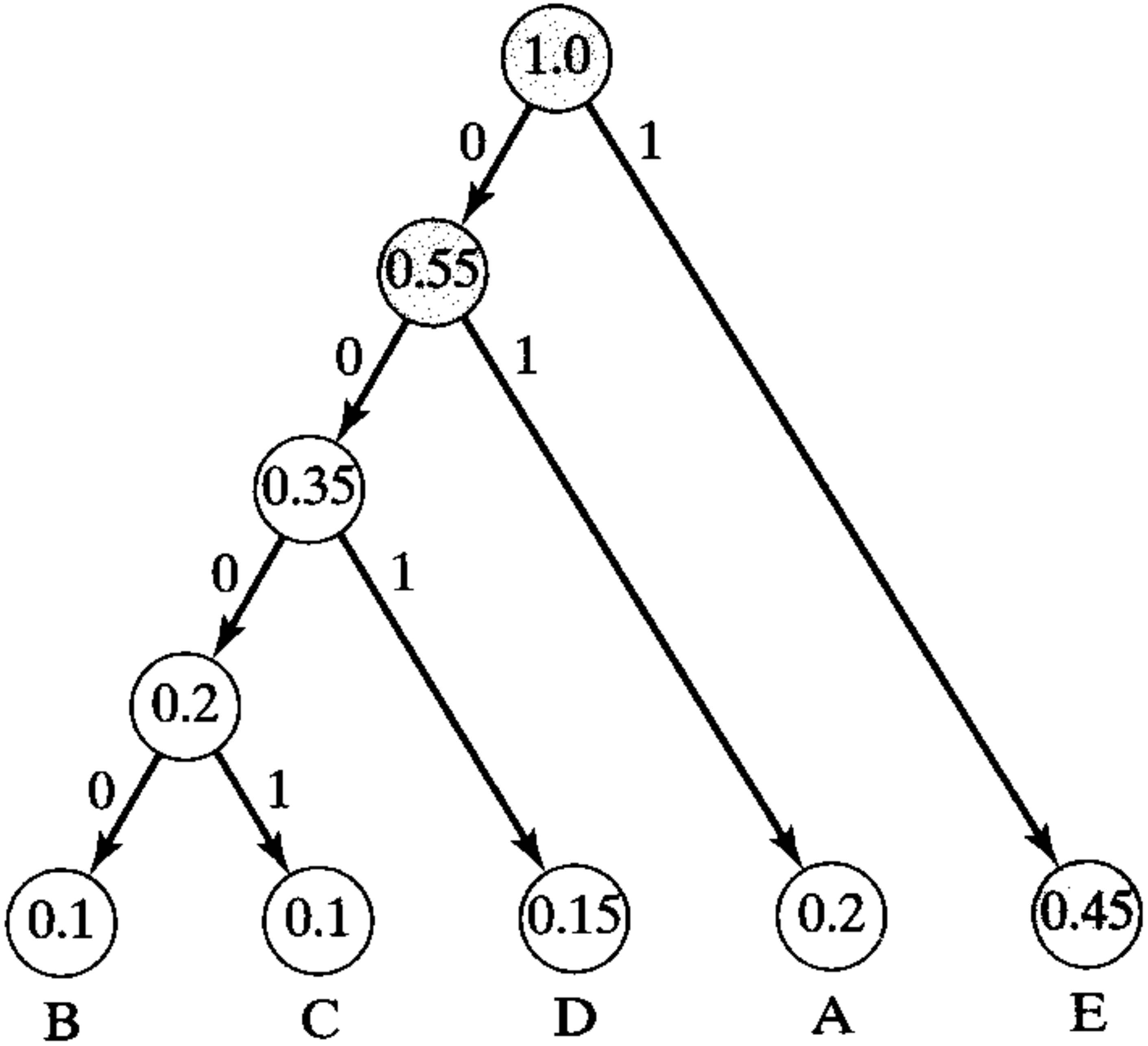
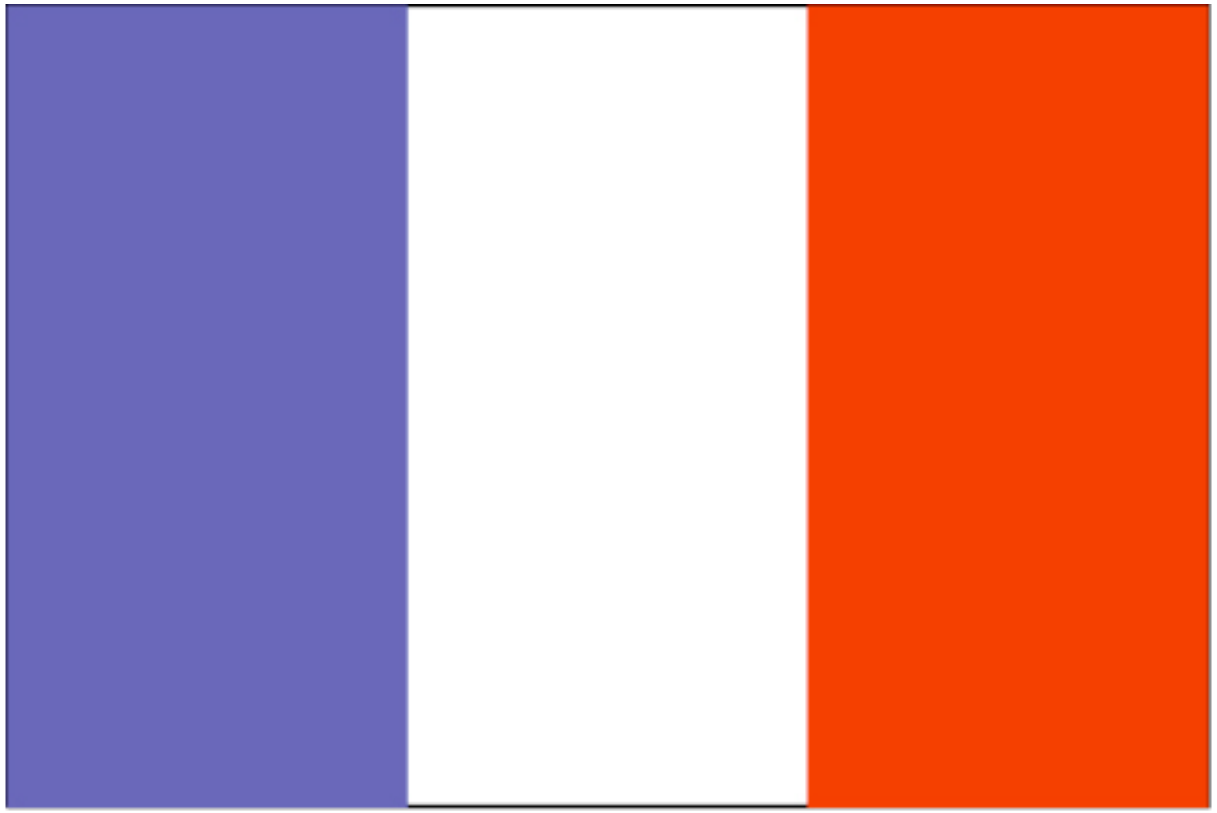


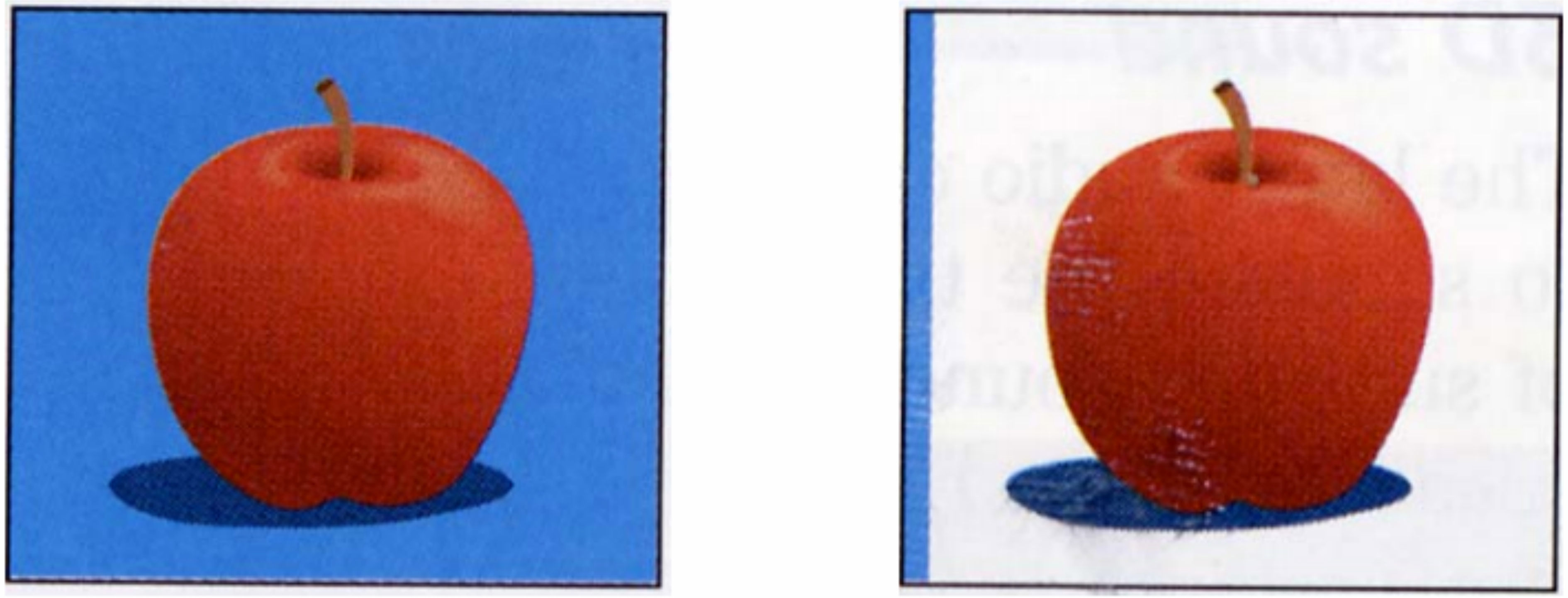
Figure by Larry Nyhoff.

```
typedef struct node
{
    char symbol;
    int frequency;
    struct node *left;
    struct node *right;
}
node;
```

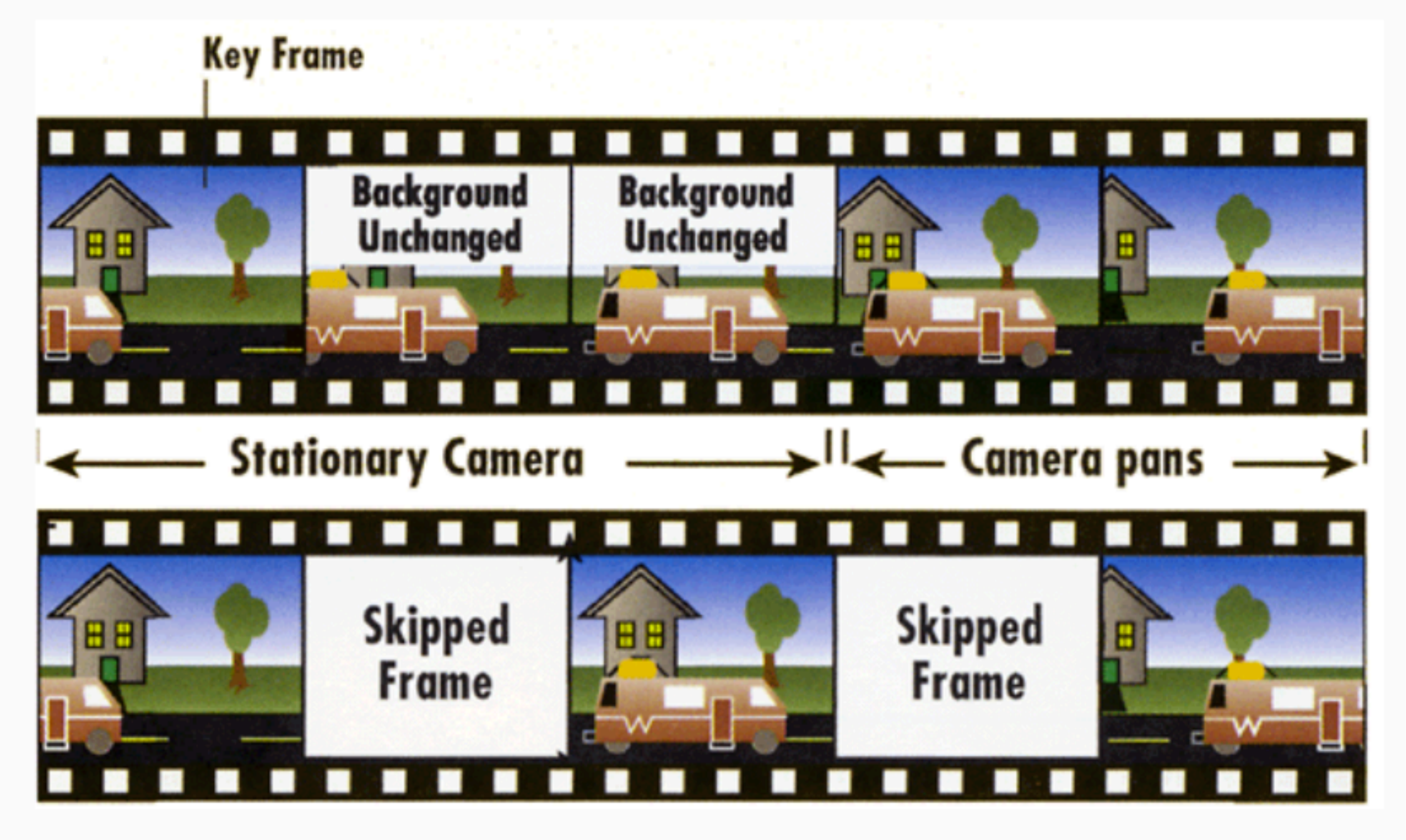
http://www.worldatlas.com/webimage/flags/flagcnty.htm



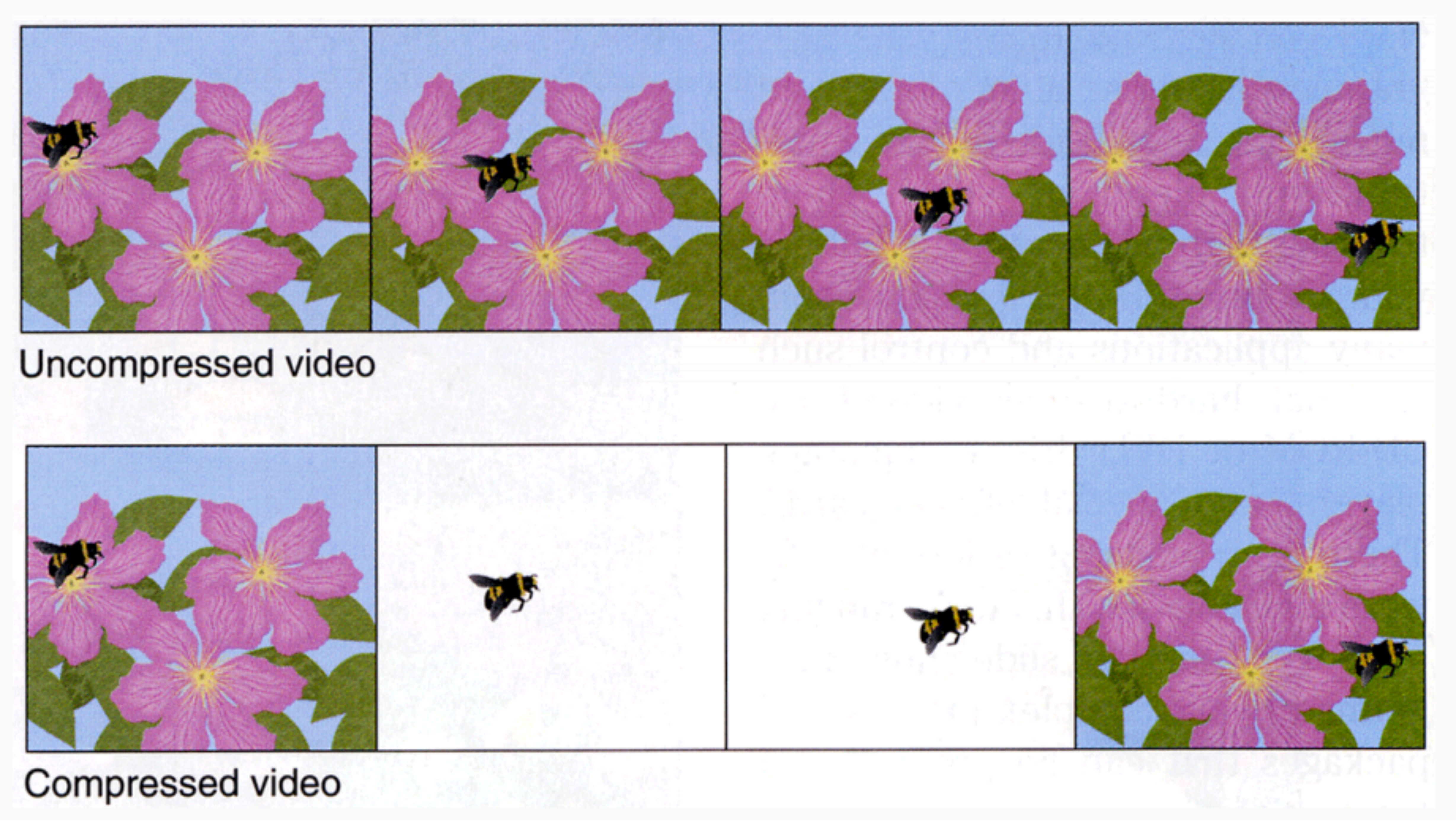
http://www.worldatlas.com/webimage/flags/flagcnty.htm



Dennis P. Curtin, *et al.*, *Information Technology: The Breaking Wave*



How Computers Work



Dennis P. Curtin, *et al.*, *Information Technology: The Breaking Wave* to be continued...