Kha Le

2/18/20

I don't know H, I only know |H|

#(H's of a given size m): C(n,m)

quiz this thursday apparently

#(W⊇H where |H|=m)

$= C(n,m) \cdot 2^{n-m}$

(C(n,m): H's; 2^{n-m}: ways of choosing W for each H.)

all W⊇H where |H|=1

H	W
{a}	{a}, {a,b}.
{b}	⋮
{c}	

$C(3,1) \cdot 2^{3-1}$

$3 \cdot 4$

$= 12$

$3 \times 4 = 12$

#((H,W)-pairs such that H⊆W) $= 3^n$

$= C(n,0) \cdot 2^n + C(n,1) \cdot 2^{n-1} + \cdots + C(n,n) \cdot 2^0$

$= (2+1)^n$

```
for (int i=0; i<n; i++)
|  if (H[i] > W[i])
|     return (false);
return (true);
```

$4^3 + 3 \cdot 4^2 + 3^2 \cdot 4 + 3^3 + 3^4$

$= \frac{4^4}{5} = \frac{256}{5} = 51.2$

#((H,W)-pairs) $= 2^n \times 2^n = 4^n$

box: 5/15/20 orange: 1/3/15

avg(oranges per box) $= \frac{1(5)+3(15)+15(20)}{5+15+20}$ $1 < \alpha < 15$

$$\frac{1 \times 4^4 + 2 \times 3 \times 4^3 + 3 \times 3^2 \times 4^2 + 4 \times 3^3 \times 4 + 5 \times 3^4 \times 1 + 5 \times 3^5}{4^5}$$

n = 5

if both are true ($H \subseteq W$ ✓ , $W \subseteq H$ ✓), $H = W$

code to test $H = W$

```
for (int i=0, i<n; i++)
    if (H[i] != W[i])
        return (false).
return (true),
```

false 1	$2 \cdot 4^{n-1}$
false 2	$2 \cdot 2 \cdot 4^{n-2}$
false 3	$2^2 \cdot 2 \cdot 4^{n-3}$
false n	$2^{n-1} \cdot 2$
true n	2^n

$$\text{avg } \#(it) = \frac{1 \cdot 32 + 2 \cdot 16 + 3 \cdot 8 + 3 \cdot 8 = 112}{(2 \cdot 4^2 + 2^2 \cdot 4 + 2^3) + 2^3 = 64}$$

$1 \leq \frac{112}{64} < 2$

over