Subset Sum

{ 1, -2, 7 }

k = 5

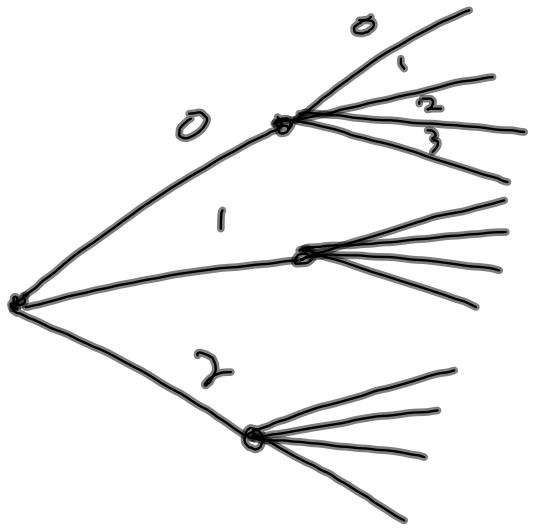
{ }	{ 1, -2 }	
{ 1 }	{ 1, 7 }	
{ -2 }	{ -2, 7 }	✓
{ 7 }	{ 1, -2, 7 }	

string	0's	1's
000		110
100		101
010		011
001		111

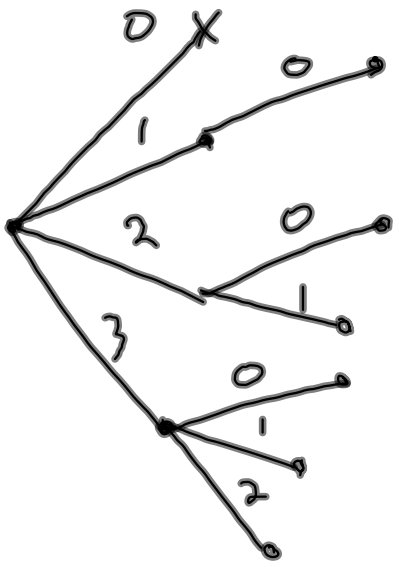
1. Test 2 was:
    a. Too long
    b. Too difficult
    c. Neither a or b.
    d. Both a and b.

2. Draw your favorite fruit.

```
n=3; m=4;
for(int i=0; i<n; i++){
    for(int j=0; j<m; j++){
        //statement
    }
}
```



```
for(int i=0; i<4; i++){
    for(int j=0; j<i; j++){
        //statement
    }
}
```

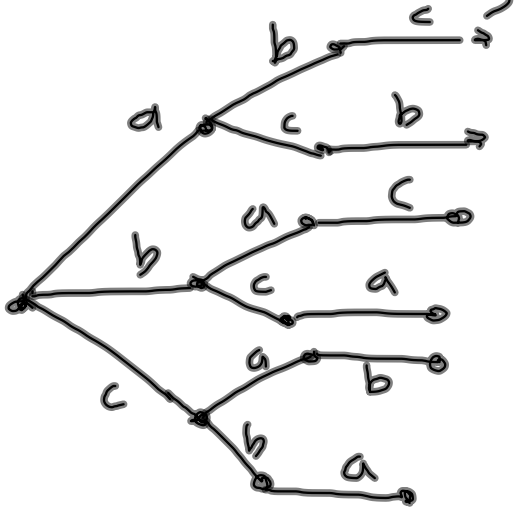


6

Permutations

- different orderings of a set of objects.

$S = \{a, b, c\}$



$3 \cdot 2 \cdot 1$ ← number of permutations

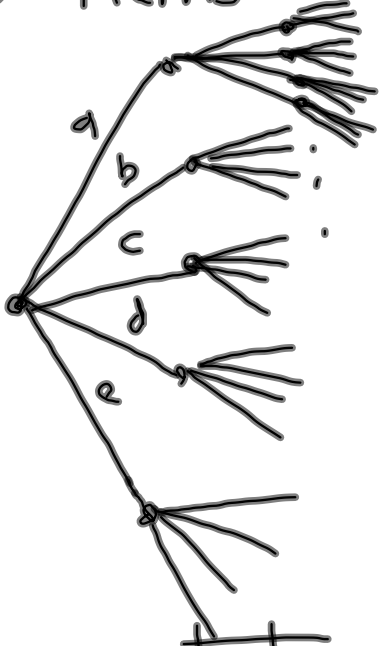
for n objects $(n \geq 1)$

$$n \cdot (n-1) \cdot (n-2) \cdots 2 \cdot 1$$

$$= n!$$

$A = \{a, b, c, d, e\}$

3 items (ordered)



$5 \cdot 4 \cdot 3$

3-perm of 5 objects

r-permutation of n objects

$$P(n,r) = n(n-1)(n-2)\cdots(n-r+1)$$

$$= \frac{n!}{(n-r)!}$$

$$\frac{5 \cdot 4 \cdot 3 \cdot \cancel{2} \cdot \cancel{1}}{\cancel{2} \cdot \cancel{1}}$$

ALGORITHM

how many 3 letter "words" can we make w/ ALGORITHM

$$P(9,3) = \frac{9!}{6!} = 9 \cdot 8 \cdot 7$$

3-perm of 9 objects

Disjoint Sets

set A is a union of mutually disjoint sets

$$A_1, A_2, A_3, \ldots A_k$$

$$N(A) = N(A_1) + N(A_2) + \ldots N(A_k)$$

$N(A)$: number of elements in A

---

number of "words" of 3 or fewer letters (a..z)

3 letters: $26 \cdot 26 \cdot 26 = 26^3$

2 letters: 26

1 letter: 26

0 letter?: 1

$$26^3 + 26^2 + 26 + 1$$

Number of 3 digit numbers divisible by 5

100, 101, 102, ... 995, ... , 999

$5 \cdot 20$ $5 \cdot 199$

$199 - 20 + 1 = 180$

---

3 digit ending in 0

$9 \cdot 10 \cdot 1 = 90$

ending in 5

$9 \cdot 10 \cdot 1 = 90$

$90 + 90 = 180$

Difference Rule

if A is finite and $B \subseteq A$

then

$$N(A - B) = N(A) - N(B)$$

3 letter words - (a..z)

26^3.

3 letter words (a..z) no repeats

$26 \cdot 25 \cdot 24$

3 letter words w/ repeats

$26^3 - 26 \cdot 25 \cdot 24$