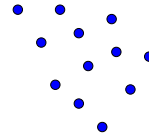


Recursive definition of  $\binom{n}{k}$

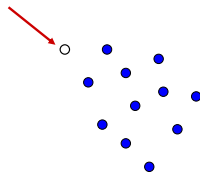
Let's write a function  $C(n, k)$

The number of ways to select  $k$  objects from a set of  $n$  objects.

$C(n, k)$

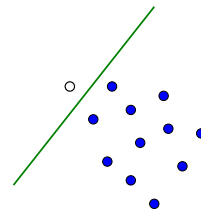


$C(n, k)$



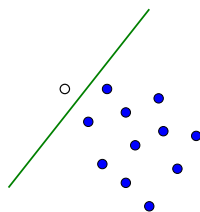
Select any one of the  $n$  points in the group

$C(n, k)$



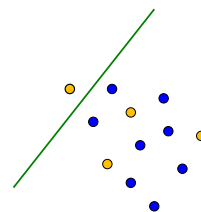
Separate this point from the rest

$C(n, 4)$



Let's consider specific problem  $C(n, 4)$

$C(n, 4)$



This point can be **included** in the 4 points we choose

$C(n,4)$

Or, it can be **excluded** from the 4 points we choose

$C(n,k)$

Total number of solutions is  
 number of solutions including  $\circ$   
 +  
 number of solutions not including  $\circ$

$C(n,k)$

Total number of solutions is  
 number of solutions including  $\circ$   
 +  
 number of solutions not including  $\circ$

$C(n,k)$

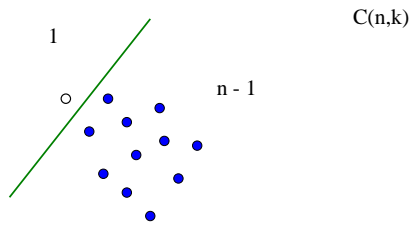
number of solutions including  $\circ$        $C(n-1, k-1)$

$C(n,k)$

number of solutions including  $\circ$        $C(n-1, k-1)$   
 number of solutions not including  $\circ$        $C(n-1, k)$

$C(n,k)$

Total number of solutions is       $C(n-1, k-1) + C(n-1, k)$



```
int C(int n, int k)
{
    if (k == 0 || n == k) return (1);
    return (C(n-1, k-1) + C(n-1, k));
}
```