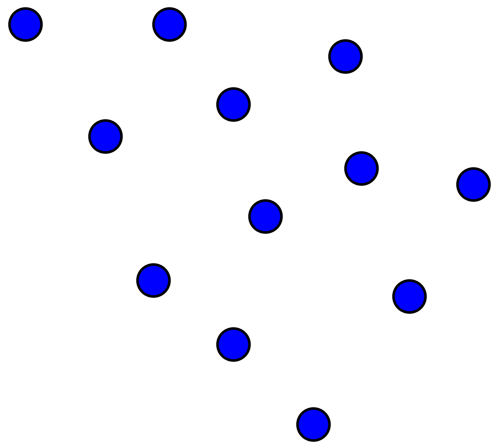
Recursive definition of $\binom{n}{k}$

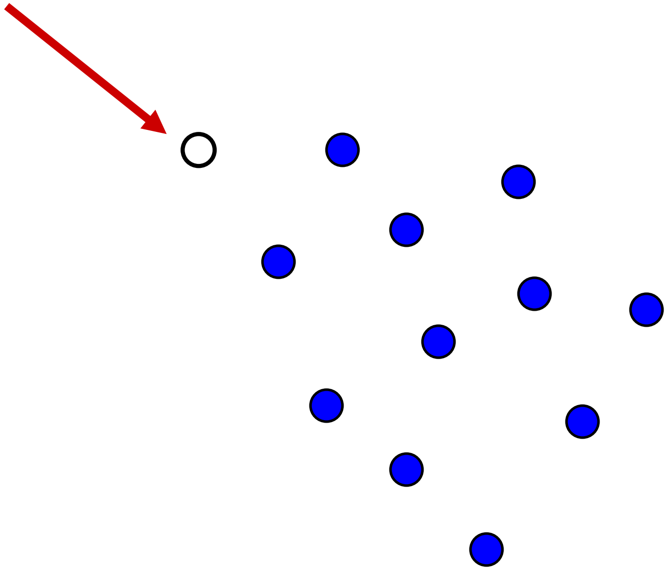
Let's write a function C(n, k)

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

C(n,k)

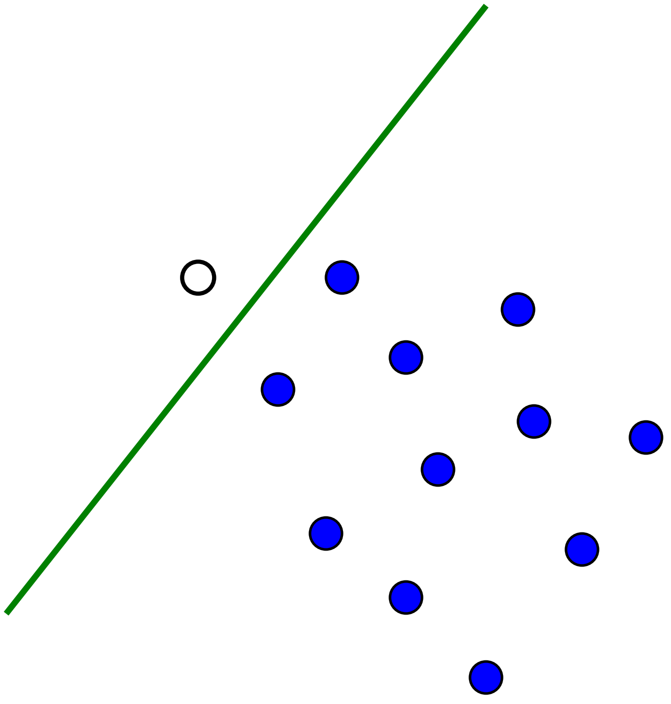


C(n,k)



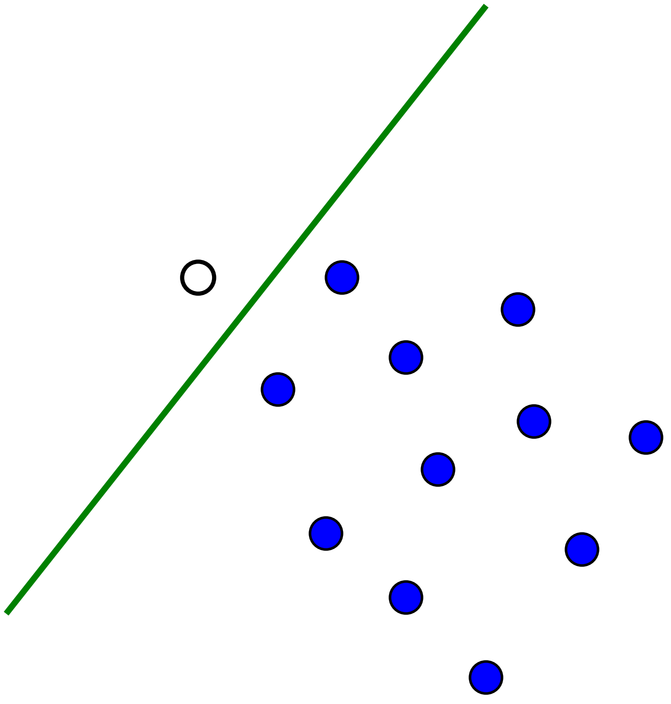
Select any one of the n points in the group

C(n,k)



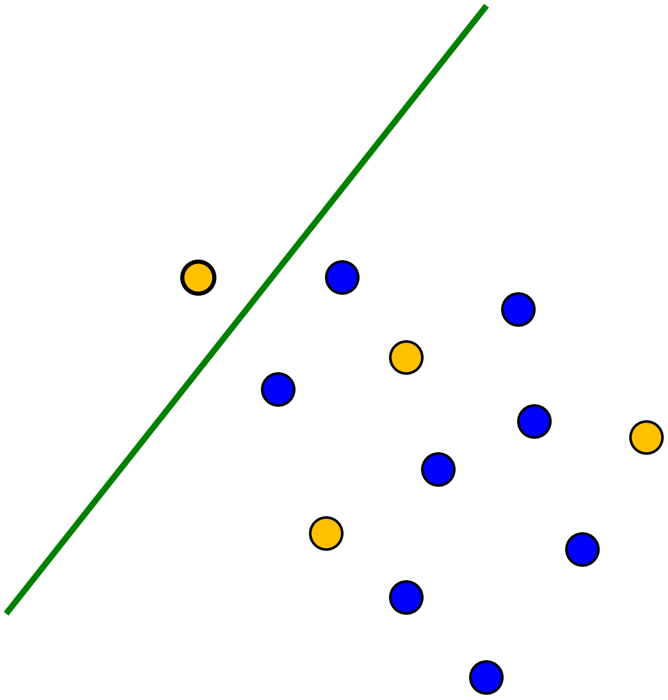
Separate this point from the rest

C(n,4)



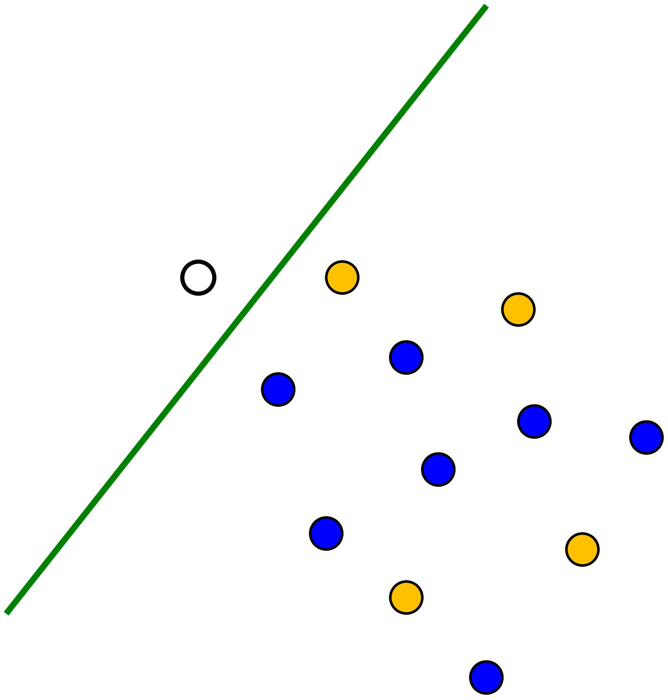
Let's consider specific problem C(n, 4)

C(n,4)



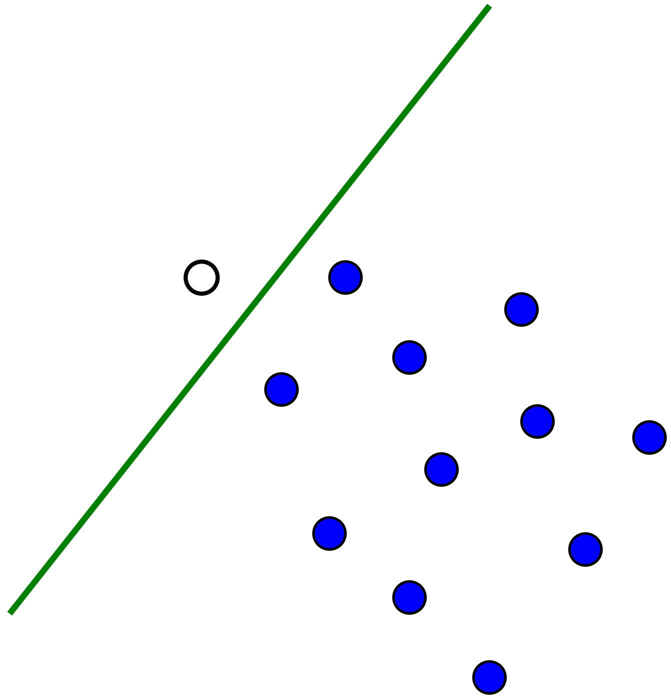
This point can be **included** in the 4 points we choose

C(n,4)



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

C(n,k)



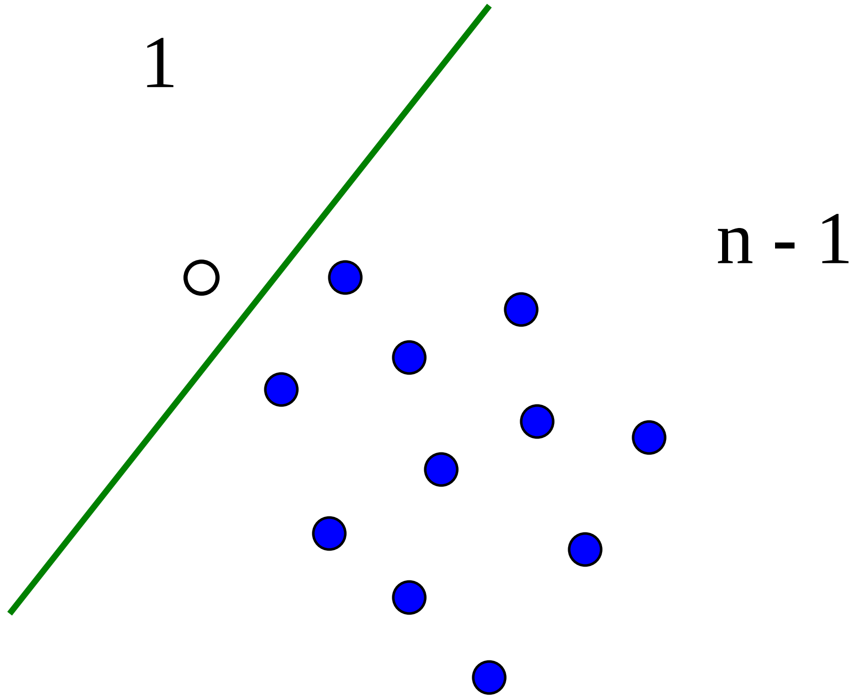
Total number of solutions is

number of solutions including ○

+

number of solutions not including ○

C(n,k)



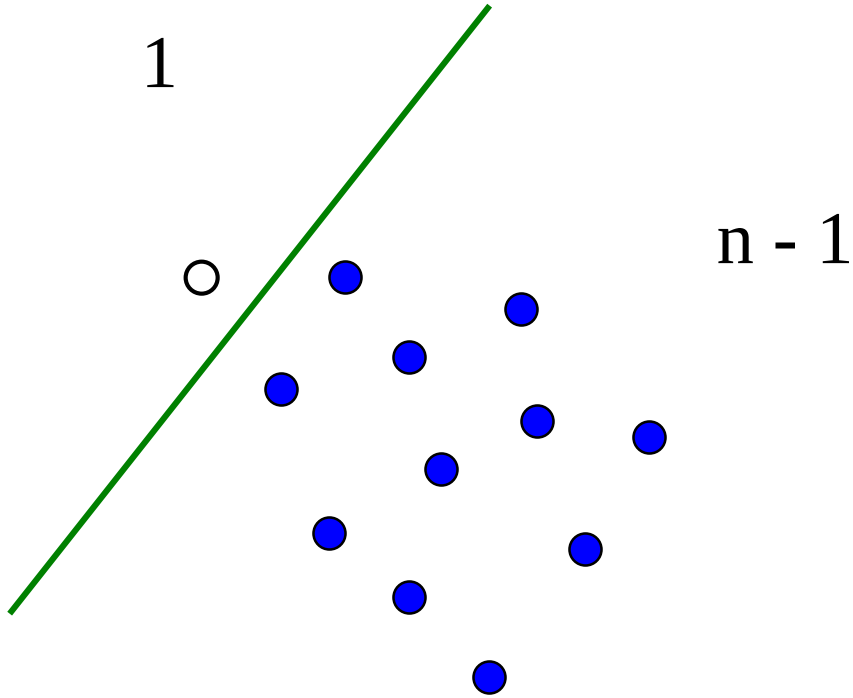
<u>Total number of solutions is</u>

number of solutions including ○

+

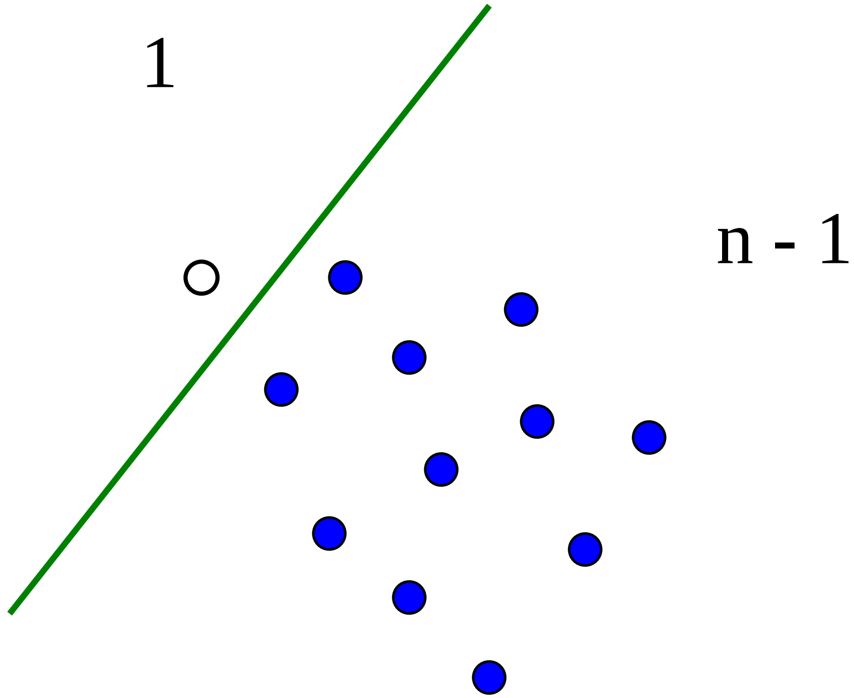
number of solutions not including ○

C(n,k)



number of solutions including **C(n-1, k-1)**

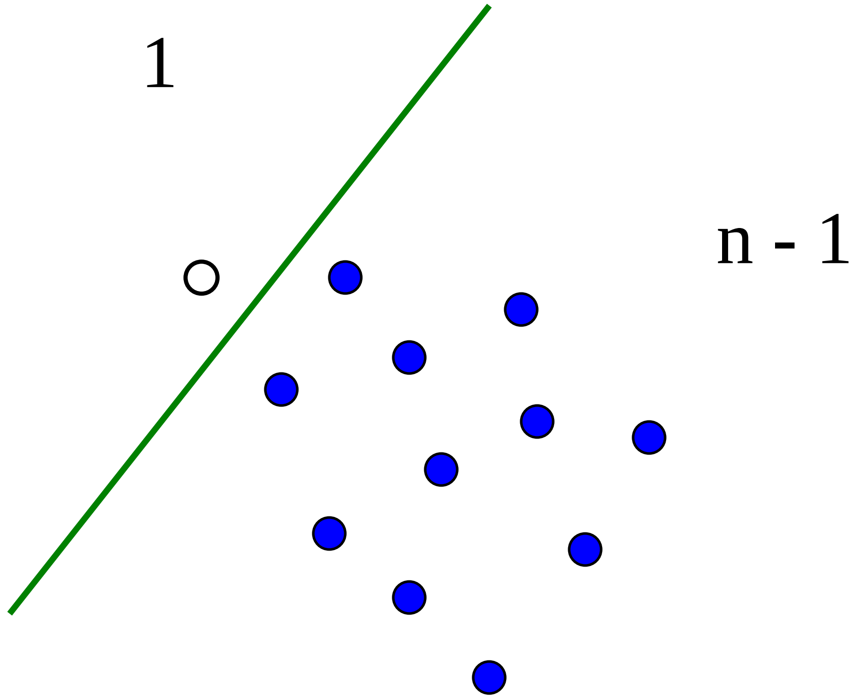
C(n,k)



number of solutions including ○ **`C(n-1, k-1)`**

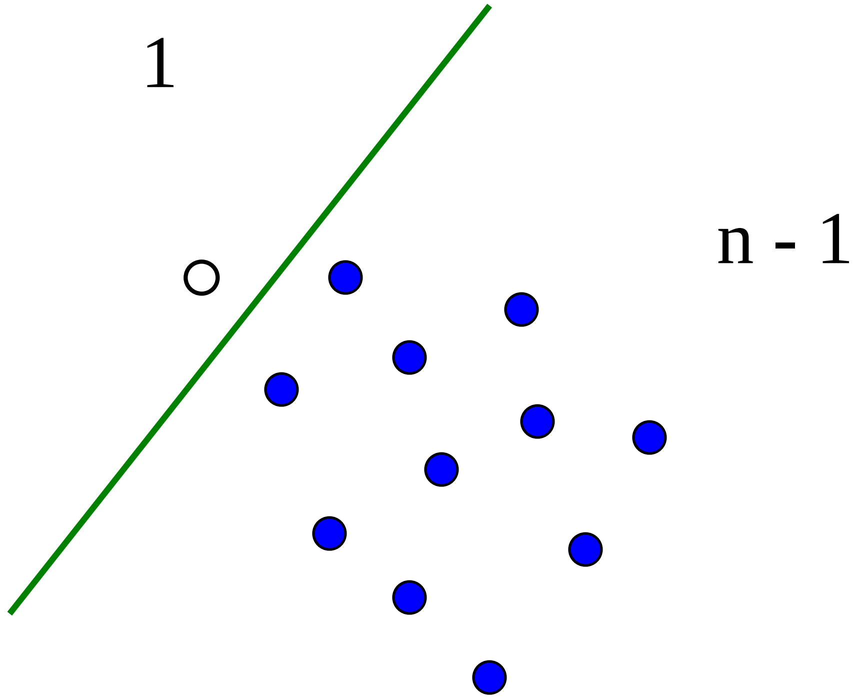
number of solutions not including ○ **`C(n-1, k)`**

C(n,k)



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

C(n,k)




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