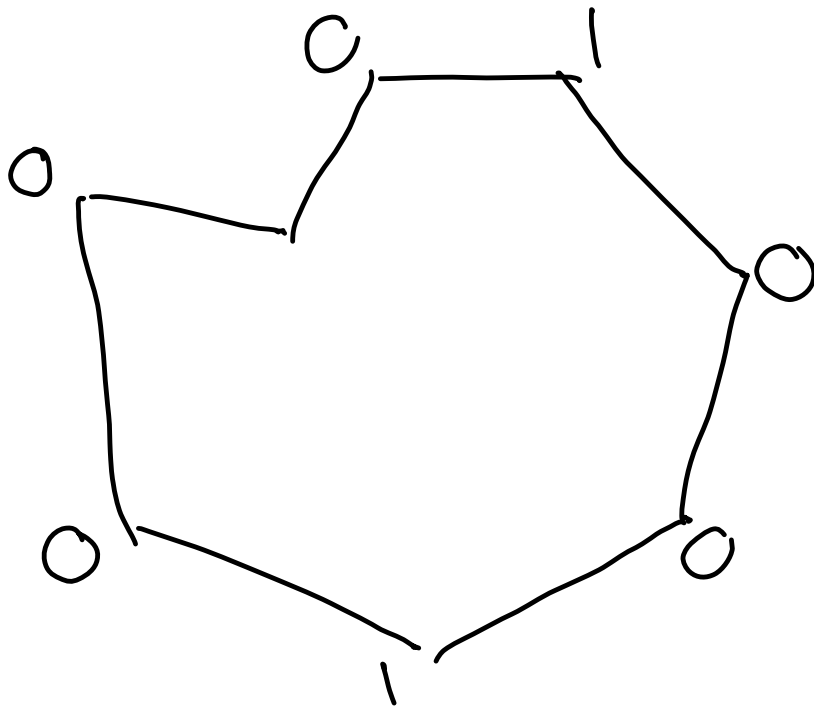


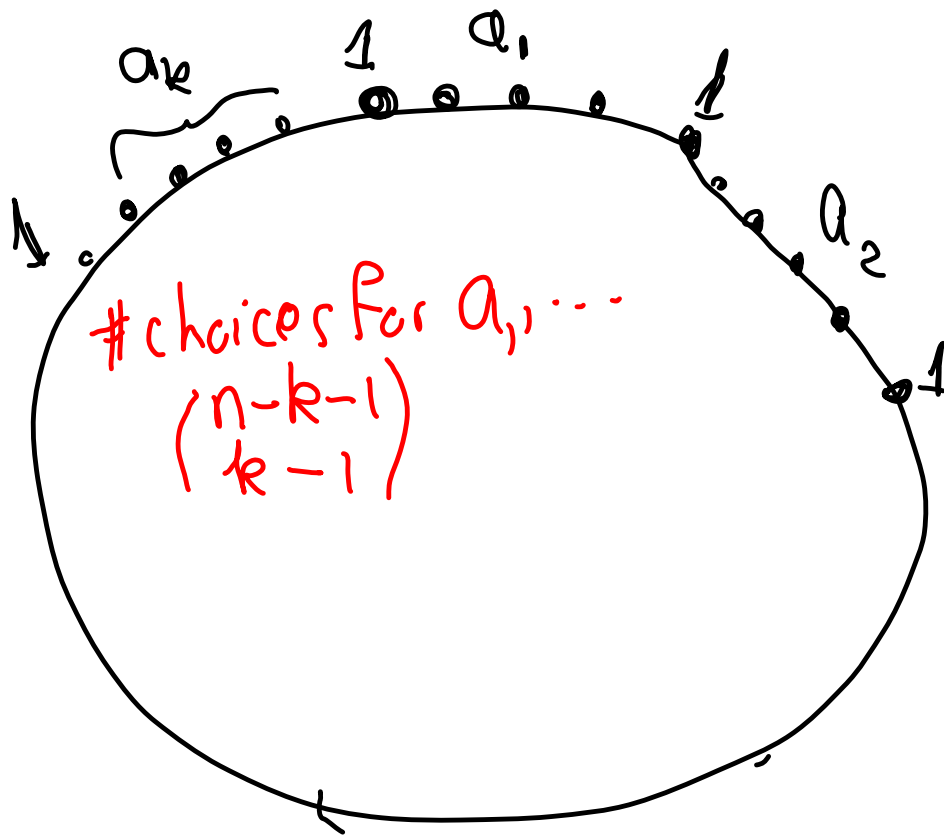
8/31/2015

Note Title

8/31/2015



At least one 0
between each 1



Choose place
 for first 1.

n choices

Then choose
 a_1, a_2, \dots, a_k

$$a_i \geq 1 \quad \&$$

$$a_1 + \dots + a_k = n - k$$

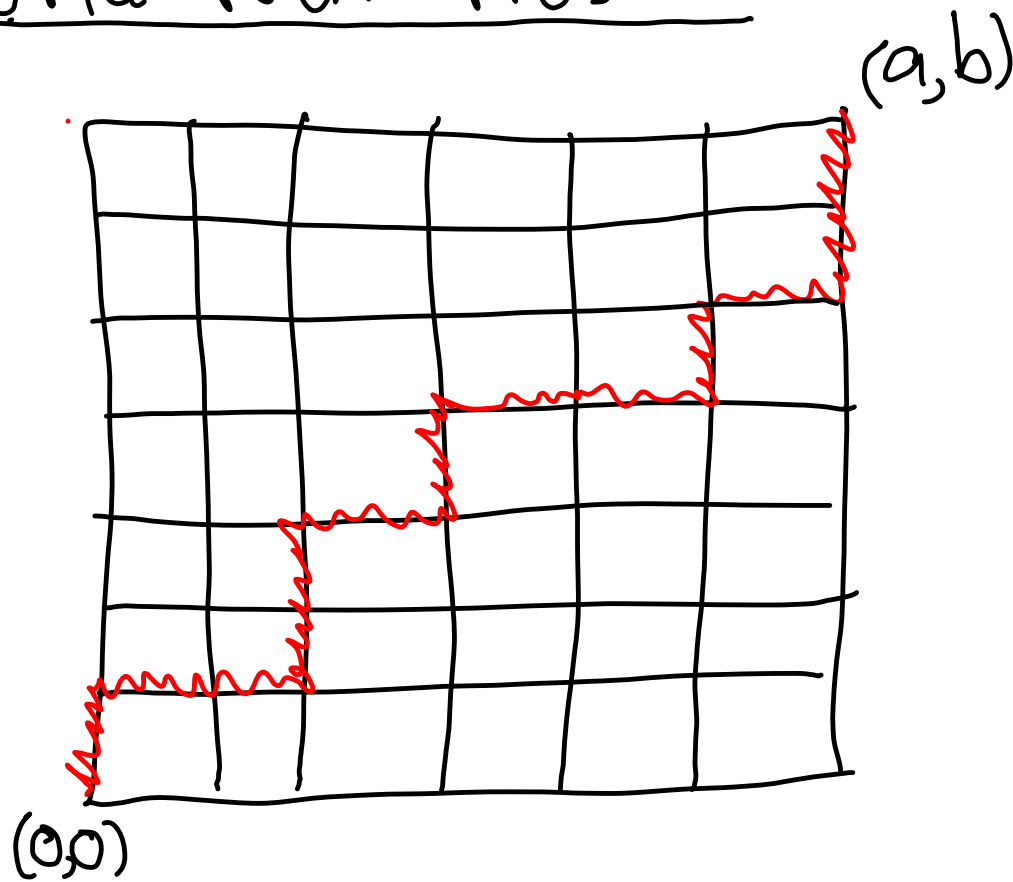
$$\text{Total} = \frac{n}{k} \binom{n-k-1}{k-1}$$

#choices for first \downarrow

\times #choices for a_1, \dots, a_k

\div k — each pattern appears k times

Grid Path Problems



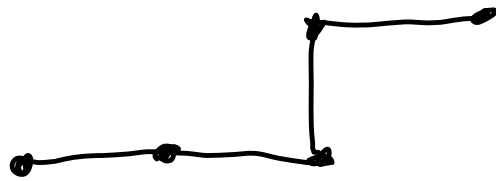
Count paths
from $(0,0)$ to (a,b) .
Path goes Right
or Up.

Monotone
Paths.

$PATHS(a, b) = \{ \text{monotone paths } (0,0) \text{ to } (a,b) \}$

There is a 1-1 correspondence between paths and sequences in $\{R, U\}^*$ with a R's and b U's.

RRUR



$$|PATHS(a,b)| = \binom{a+b}{a}$$

Now assume $a < b$.

$\text{PATHS}_{\geq}(a, b) = \{ P \in \text{PATHS}(a, b) : \text{Only meets diagonal at } (0, 0). \}$

