

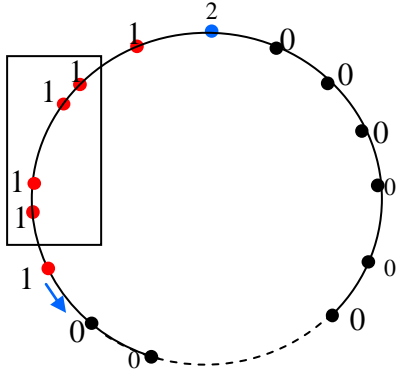
15.03.2012

Number of bracelets made with 1 blue, r identical red and n identical black beads.

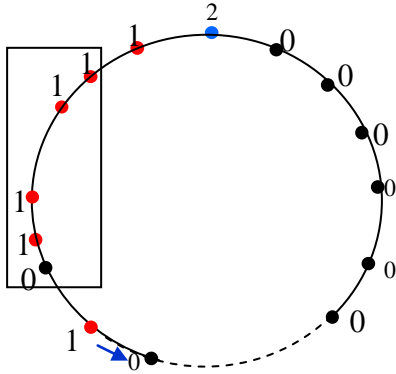
**Teorem :** 1 tane mavi, r tane özdeş kırmızı ve n tane özdeş siyah boncuklar ile yapılacak

bilekliklerin sayısı  $F(1, r, n)$  ise  $F(1, r, n) = \binom{n+r-1}{5} + F(1, r-2, n) + F(1, r, n-2)$  dir.

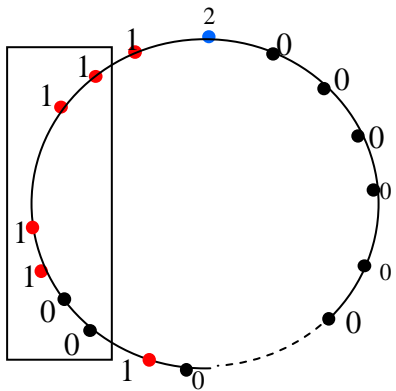
İSPAT :



$\underbrace{111\dots1}_r$  kendi arasındaki sıralaması  $\binom{r}{r}$   
tane durum vardır



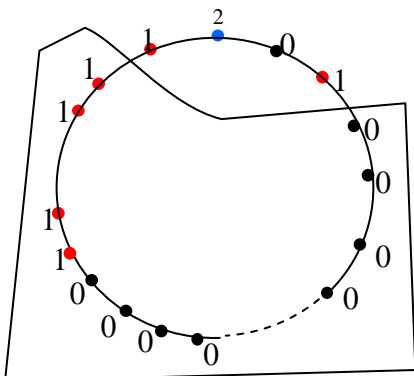
$\underbrace{111\dots10}_r$  kendi arasındaki sıralaması  
 $\binom{r+1}{r}$  tane durum vardır.



$\underbrace{111\dots100}_r$  kendi arasındaki sıralaması  
 $\binom{r+2}{r}$  tane durum vardır.

⋮  
⋮  
⋮

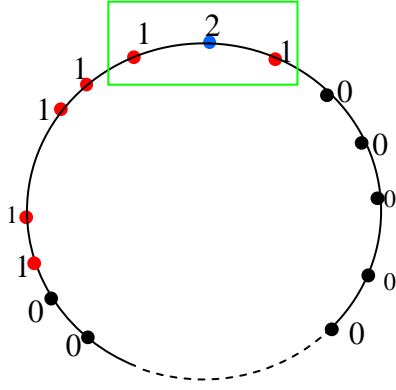
Benzer olarak devam edersek .  $\underbrace{111\dots100\dots0}_r$  kendi arasındaki



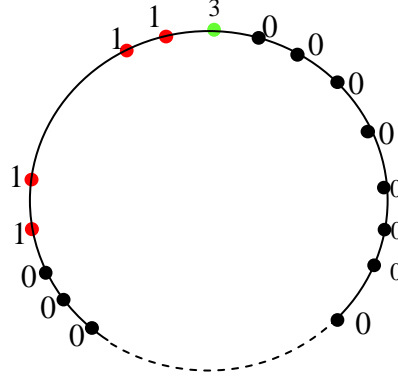
sıralaması  $\binom{n+r-2}{r}$  tane durum vardır.

Elde ettiğimiz bütün durumları toplarsak

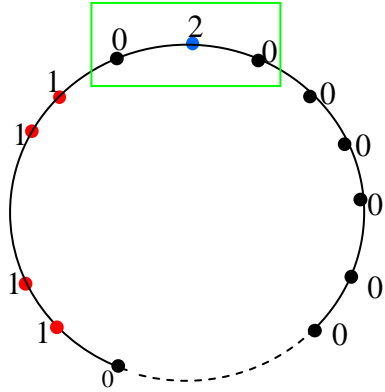
$$\binom{r}{r} + \binom{r+1}{r} + \binom{r+2}{r} + \dots + \binom{n+r-2}{r} = \binom{n+r-1}{r+1}$$



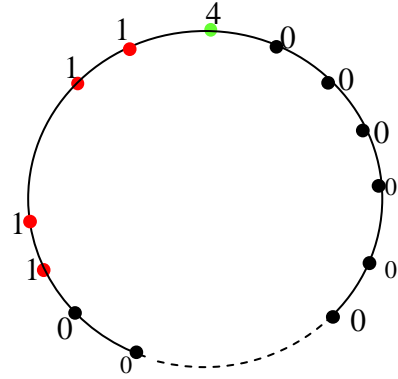
(121) → 3



$F(1, r-2, n)$  Tane durum vardır.



(121) → 4



$F(1, r, n-2)$  durum oluşur.

Oluşacak toplam durum sayısı:

$$F(1, r, n) = \binom{n+r-1}{5} + F(1, r-2, n) + F(1, r, n-2) \text{ ile ifade edebiliriz.}$$