

5.5.1 Tournament Selection

Q

Name	fitness
A	10
B	5
C	8
D	2
E	12
Sum	37

- ① $k=3$ size of sample.
- ② picking without replacement
- ③ fittest contestant always win ($p=1$)

Solution ① list all possible results

$$\binom{5}{3} = 10$$

win

ABC	A
ABD	A
ABE	E
ACD	A
ACE	E
ADE	E

$$C_5^3 = \frac{5 \times 4 \times 3}{1 \times 2 \times 3} = 10$$

A	B	C	D	E
10	5	8	2	12

$E > A > C > B > D$

BCD	C
BCE	E
BDE	E
CDE	E

② Count win num.

A : 3

B : 0

C : 1

D : 0

E : 6

③ $p(A) = 0.3$ $p(B) = 0$ $p(C) = 0.1$ $p(D) = 0$ $p(E) = 0.6$

selection pressure : $k \uparrow$ $p(E) \uparrow$