In [42]:

```
import random
import numpy as np
import pandas as pd

def matchgame(way):
    if way ==1:
        random.seed(0)
        p = np.array([0.1, 0.9, 0.0])
        index = np.random.choice([-1, 0, 1], p = p.ravel())
    elif way ==2:
        random.seed(0)
        p = np.array([0.55, 0.0, 0.45])
        index = np.random.choice([-1, 0, 1], p = p.ravel())
    return index
i=0
result=[]
while i<10000:
    reward=0
    t=0
    while t<100:
        x=random.randint(1,2)
        if t<5:
            reward = reward+matchgame(x)
            t=t+1
        elif t>=5 and reward<1:
            reward = reward+matchgame(x)
            t=t+1
        elif t>=5 and matchgame(x)==1:
            result.append(t)
            break
    i=i+1

pd.value_counts(result).head(5)
```

Out[42]:

```
5     4130
7      654
9      412
11     290
13     220
dtype: int64
```

As a result, The most likely way to win is to play 5+1= 6 games. So the best way to win is timid-timid-timid-timid-timid-bold