

Analysis: Card Game

For small dataset, there is a greedy solution - we can choose any 3 adjacent cards with same number, until we can't find such triple.

For large dataset, there it's a dynamic programming problem. We can define a state **DP[i][j]**, which indicates the smallest number of card Bob can not drop if we consider all cards with index from **i** to **j**. So for every legal state, we have four choices:

- Get rid of the card with index **i**
- Get rid of the card with index **j**
- Choose a card with index **k**, which meets

$$a_j - a_k = a_k - a_i = K$$

- Choose a card with index **k**, and split the cards into two parts(one from **i** to **k** and the other one from **k + 1** to **j**)