Gin Rummy - Perfect Hand

Gin Rummy was created with the intention of being faster than basic Rummy. The rules are very easy to learn as it is simply a matter of the draw and discard, without the complications attached to displaying melds and laying off cards between turns. Both of these things are done at the end of a hand and Gin Rummy is often played without any kind of laying off making for a "quick fire" game. These rules were originally written to facilitate offline play but often also apply to the game of Gin Rummy that is played online.

For more details you can check this address: https://www.pagat.com/rummy/ginrummy.html

Deck

Gin Rummy is primarily a two player game. A deck of 52 cards is used, there are no wild cards or joker cards.

1	ACE SPADES	14	ACE DIAMONDS	27	ACE HEARTS	40	ACE CLUBS
2	2 SPADES	15	2 DIAMONDS	28	2 HEARTS	41	2 CLUBS
3	3 SPADES	16	3 DIAMONDS	29	3 HEARTS	42	3 CLUBS
4	4 SPADES	17	4 DIAMONDS	30	4 HEARTS	43	4 CLUBS
5	5 SPADES	18	5 DIAMONDS	31	5 HEARTS	44	5 CLUBS
6	6 SPADES	19	6 DIAMONDS	32	6 HEARTS	45	6 CLUBS
7	7 SPADES	20	7 DIAMONDS	33	7 HEARTS	46	7 CLUBS
8	8 SPADES	21	8 DIAMONDS	34	8 HEARTS	47	8 CLUBS
9	9 SPADES	22	9 DIAMONDS	35	9 HEARTS	48	9 CLUBS
10	10 SPADES	23	10 DIAMONDS	36	10 HEARTS	49	10 CLUBS
11	JACK SPADES	24	JACK DIAMONDS	37	JACK HEARTS	50	JACK CLUBS
12	QUEEN SPADES	25	QUEEN DIAMONDS	38	QUEEN HEARTS	51	QUEEN CLUBS
13	KING SPADES	26	KING DIAMONDS	39	KING HEARTS	52	KING CLUBS

The value of the cards in each suit (**Spades, Hearts, Diamonds, Clubs**) rank, from low to high:

Ace is 1 point. Face cards Jack, Queen and King's value is 10 points. Number cards are worth their spot (index) value.

Object of the Game

The purpose of the game is to complete a hand where most or all of the cards can be combined into sets and runs. And the point value of the remaining unmatched (are not part of a valid combination) a.k.a. **deadwood cards** are as low as possible.

A Run (sequence) is comprised of three or more cards bearing the same suit and in consecutive order such as for example:

A Set, on the other hand, is a group of three or four cards that are identical rank and of different suits, such as for example:

A card can be used only once – either in a Set or in a Run. You cannot use the same card for both a Run and a Set.

Deadwood - Any remaining cards from your hand which are not part of a valid combination (set or run) are called deadwood.

Question

You are playing a Gin Rummy game and **you are the person who did not deal** the cards so you have to take the **turned-up card**. Your mission is to create the perfect hand (**combining the cards into valid sets and/or runs**) according to dealt cards (**10 random cards from deck**) and one **turned-up** card. That means **you will have 11 cards in hand**. And after combined cards, **calculate the lowest possible deadwood value of remaining cards**.

Hint: You can use Card Codes table below for calculation of deadwood and creating combinations.

Input & Output

In the input you will get **11 number** separated with '**-**'. **First ten number** represent the hand and **the last number** is turned-up card.

As output you should provide the **lowest possible deadwood value** according to deadwood cards which are the remaining cards after all valid combinations (sets or runs).

Sample input: **27-2-18-30-1-16-43-4-14-3-17**
Output for above sample input should be: **2**

Another sample input: **19-13-47-18-26-32-2-52-8-21-37**
Output for this input should be: **29**

Another sample input: **47-14-32-40-5-6-7-8-19-21-27**
Output for this input should be: **12**

Another sample input: **47-33-32-40-5-6-17-8-19-46-27**
Output for this input should be: **41**

Input & Output Sample 1

In the input first ten number represent the hand and the last number is turned-up card.

Sample input: **27-2-18-30-1-16-43-4-14-3-17**
According to this input my (sorted) hand is **1-2-3-4-30-43-16-17-18-14**
and turned-up card is **17**

As output you should provide the **lowest possible deadwood value** according to deadwood cards which are remaining cards after all valid combinations (sets or runs).

Output for above sample input should be: **2**

So **14** and **27** is the deadwood cards and **2** is the value of the deadwood.

This output is generated according to below **valid** and **correct** combination:

```
{
    "combination_1": [1,2, 3],
    "combination_2": [4, 30, 43],
    "combination_3": [16, 17, 18],
    “deadwood_cards": [14, 27],
}
```

Below one is also **valid** but **not correct** combination, according to this combination the output should be **10** which is a valid hand but not perfect one (not the lowest possible deadwood value). That is why this is not a correct answer.

```
{
    "combination_1": [1,2, 3, 4],
    "combination_2": [16, 17, 18],
    "combination_3": [],
    “deadwood_cards": [14, 30, 43,27],
}
```

Input & Output Sample 2

In the input first ten number represent the hand and the last number is turned-up card.

Another sample input: **19-13-47-18-26-32-2-52-8-21-37**
According to this input my (sorted) hand is **8-21-47-13-26-52-2-18-19-32** and turned-up card is **37**

As output you should provide the **lowest possible deadwood value** according to deadwood cards which are remaining cards after all valid combinations (sets or runs).

Output for this input should be: **29**

According to this output **2-18-19-32-37** are the deadwood cards and **29** is the value of the deadwood.

This output is generated according to below **valid** and **correct** combination:

```
{
        "combination_1": [8, 21, 47],
        "combination_2": [13, 26, 52],
        "combination_3": [],
        “deadwood_cards": [2,18,19,32,37]
}
```

Card Codes

1	ACE SPADES	14	ACE DIAMONDS	27	ACE HEARTS	40	ACE CLUBS
2	2 SPADES	15	2 DIAMONDS	28	2 HEARTS	41	2 CLUBS
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