Invoker

Time limit per test: 0.5 seconds
Memory limit per test: 1 gb

Mr. K loves to play DOTA 2. It is a game where heroes (characters) can use items and cast spells. Recently, Mr. K has started playing with Invoker. Invoker has a unique way of casting spells as described below.

He has three types of orbs, namely, Quas, Wex, and Exort. A new orb of a particular type can be generated by pressing the key ‘Q’, ‘W’, or ‘E’ respectively. At one instant, a maximum of three orbs can exist and so, if there are already three orbs and another one is generated, the orb that was created the earliest is destroyed. For example, consider the state Exort-Quas-Exort (in order of earliest to latest). Generating the Wex orb in this state will give us the state Quas-Exort-Wex (the leftmost Exort orb is destroyed and a new orb of type Wex is added from right). In order to generate a spell, the ‘R’ key must be pressed while Invoker has at least three orbs. After that, one more key press is needed to use the spell.

Every unique combination of orbs can generate a unique spell. Quas-Quas-Wex and Quas-Wex-Wex will generate different spells whereas, Quas-Exort-Exort and Exort-Exort-Quas will generate the same spell. As such, there are 10 different spells that can be generated.

1	QQQ (representing Quas-Quas-Quas)
2	WWW
3	EEE
4	QQW
5	QQE
6	WWQ
7	WWE
8	EEQ
9	EEW
10	QWE

Also, note that generating a spell causes previously generated spells to get destroyed (only one spell stays castable at one time) and Invoker starts with no orbs.

Mr. K likes to cast his spells in the form of clusters. A cluster is simply a set of spells that are casted one after another in any order with the restriction that a spell that is not part of the cluster will not be cast in between. For example, consider that he has a cluster he wants to cast which has spell numbers 10, 6, 2, and 2 (2 is to be casted twice). Invoker starts with zero orbs. Mr. K presses ‘W’ thrice to get the orb state of Wex-Wex-Wex and then ‘R’ to create spell number 2. A

further two key presses are done to use the spell twice. Then, Mr. K presses ‘Q’ to achieve the state Wex-Wex-Quas and then ‘R’ to create spell number 6. A further one key press is done to use the spell once. Finally, Mr. K presses ‘E’ to achieve the state Wex-Quas-Exort and then ‘R’ to create spell number 10. A further one key press is done to use the spell once. This brings the total number of key presses to 12.

Just casting clusters of spells won’t win Mr. K the game so he would like to play combos with Invoker and still stay as efficient as possible (**press as few keys as possible**). A combo is a set of clusters casted in a given order (**the order of casting spells in a cluster itself does not matter but the clusters themselves should be casted in the given order**).

For example, consider the following combo consisting of two clusters (sample test case 1):

1) 1, 2, 2, 5
2) 10, 9, 7, 6

Since the order of spells does not matter in a single cluster, Mr. K chooses the ordering [1, 5, 2, 2] for cluster 1 and [7,9,10,6] for cluster 2 (this ordering has been selected to minimize the number of key presses). First, Mr. K first presses ‘Q’ thrice to get QQQ and then builds and uses the spell once (5 presses till now). He then presses ‘E’ once to get QQE and then builds and uses the spell once (8 presses till now). He then presses ‘W’ thrice to get WWW and then builds and uses the spell twice (14 presses till now). Now he moves onto the second cluster. He presses ‘E’ once to get WWE and then builds and uses the spell once (17 presses till now). Next he presses ‘E’ once more and gets WEE and then builds and uses the spell once (20 presses till now). He then presses ‘Q’ once and then ‘W’ once to get EQW and then builds and uses the spell once (24 presses till now). Lastly, he presses ‘W’ once to get QWW and then builds and uses the spell once (27 presses till now). It can be proved that a more efficient way to perform this combo is not possible.

Given a list of clusters, help Mr. K find the minimum number of key presses required to cast all of them in the order they are given in.

Input:

The first line of input contains a single integer $\boldsymbol{C}(1<=\boldsymbol{C}<=1x10^3)$ representing the number of clusters in the combo. This is followed by a description of each cluster.

The first line of the description of a cluster contains a single integer $\boldsymbol{N}(1<=\boldsymbol{N}<=2x10^5)$ representing the number of spells in it.

The second line of the description of a cluster contains N space separated integers A_i($1<=A_i<=10$) representing the spells to be casted.

It is guaranteed that the sum of N across all clusters will not exceed $1x10^6$.

Output:

Output a single integer representing the minimum number of key presses required to cast all the clusters in the given order.

Example:

Input
2 4 1 2 2 5 4 10 9 7 6
Output
27

Input
3 2 1 2 2 3 4 2 5 6
Output
26