Problem E. Perfect Standings

Time limit 2000 ms
Mem limit 1048576 kB

Problem Statement

Takahashi decided to hold a programming contest.

The contest consists of five problems: A, B, C, D, E, with scores a, b, c, d, e, respectively.

There are 31 participants, and all of them solved at least one problem.

More specifically, for every non-empty subsequence (not necessarily contiguous) of the string `ABCDE`, there is a participant named after that subsequence who solved the problems corresponding to the letters in their name and did not solve the other problems.

For example, participant A solved only problem A, and participant BCE solved problems B, C, and E.

Print the names of the participants in order of their obtained scores, from the largest to the smallest. The score obtained by a participant is the sum of the scores of the problems they solved.

If two participants obtained the same score, print the one whose name is lexicographically smaller first.

▶ What does "lexicographically smaller" mean?

Constraints

- $100 \leq a \leq b \leq c \leq d \leq e \leq 2718$
- All input values are integers.

Input

The input is given from Standard Input in the following format:

```
a b c d e
```

Output

Print 31 lines. The i-th line $(1 \leq i \leq 31)$ should contain the name of the participant who obtained the i-th highest score. If multiple participants have the same score, print them in lexicographical order.

Sample 1

Input	Output
400 500 600 700 800	ABCDE BCDE ACDE ABDE ABCE ABCD CDE BDE ADE BCE ACE BCD ABE ACD ABD ABC DE CE BE CD AE BD AD BC AC AB E D C B A

The score of each participant is as follows:

1	ABCDE	3000	400	500	600	700	800
2	BCDE	2600	-	500	600	700	800
3	ACDE	2500	400	-	600	700	800
4	ABDE	2400	400	500	-	700	800
5	ABCE	2300	400	500	600	-	800
6	ABCD	2200	400	500	600	700	-
7	CDE	2100	-	-	600	700	800
8	BDE	2000	-	500	-	700	800
9	ADE	1900	400	-	-	700	800
9	BCE	1900	-	500	600	-	800
11	ACE	1800	400	-	600	-	800
11	BCD	1800	-	500	600	700	-
13	ABE	1700	400	500	-	-	800
13	ACD	1700	400	-	600	700	-
15	ABD	1600	400	500	-	700	-
16	ABC	1500	400	500	600	-	-
16	DE	1500	-	-	-	700	800
18	CE	1400	-	-	600	-	800
19	BE	1300	-	500	-	-	800
19	CD	1300	-	-	600	700	-
21	AE	1200	400	-	-	-	800
21	BD	1200	-	500	-	700	-
23	AD	1100	400	-	-	700	-
23	BC	1100	-	500	600	-	-
25	AC	1000	400	-	600	-	-
26	AB	900	400	500	-	-	-
27	E	800	-	-	-	-	800
28	D	700	-	-	-	700	-
29	C	600	-	-	600	-	-
30	B	500	-	500	-	-	-
31	A	400	400	-	-	-	-

For example, ADE and BCE obtained the same score, and ADE is lexicographically smaller, so print ADE before BCE.

Sample 2

Input	Output
800 800 900 900 1000	ABCDE ACDE BCDE ABCE ABDE ABCD CDE ACE ADE BCE BDE ABE ACD BCD ABC ABD CE DE AE BE CD AC AD BC BD AB E C D A B

Sample 3

Input	Output
128 256 512 1024 2048	ABCDE BCDE ACDE CDE ABDE BDE ADE DE ABCE BCE ACE CE ABE BE AE E ABCD BCD ACD CD ABD BD AD D ABC BC AC C AB B A