Problem A. Can't Wait for Holiday

Input file:	standard input
Output file:	standard output
Time limit:	1 second
Memory limit:	256 megabytes

Given is a string `S` representing the day of the week today.

`S` is SUN, MON, TUE, WED, THU, FRI, or SAT, for Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday, respectively.

After how many days is the next Sunday (tomorrow or later)?

Output

Print the number of days before the next Sunday.

Examples

standard input	standard output
SAT	1
SUN	7

Problem B. Unique array

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

You are given an array with size - `N`.

Your task is - to determine the uniqueness of an array.

Input

In the first line given `N` - the size of the array.

In the next line given elements.

Output

Print YES if the given array contains only unique elements, otherwise print NO.

Examples

standard input	standard output
7 2 4 3 -1 7 12 -4	YES
5 5 2 -3 2 1	NO

Note

Use STL container - set.

Problem C. Who is the best?

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

You are given list of students name and their points. Askar Agay wants to find out who scored the most points by percentage. Askar Agay is busy with the NEERC final, he asks you to help him.

Input

You are given list of students name, and points student earned.

Output

Print students name and by points scored as a percentage of total points in descending order.

Examples

standard input	standard output
10 Nurzhan 30 Gaziz 20 Aldiyar 25 Mikhail 10 Ali 10 Mikhail 5 Nurzhan 5 Temur 28 Gaziz 2 Aldiyar 5	Nurzhan 25% Aldiyar 21.4286% Temur 20% Gaziz 15.7143% Mikhail 10.7143% Ali 7.14286%
5 Aspan 10 Aykhan 20 Bekbolat 10 Aspan 35 Bekbolat 30	Aspan 42.8571% Bekbolat 38.0952% Aykhan 19.0476%

Problem D. Matrix none square

Input file:	standard input
Output file:	standard output
Time limit:	1 second
Memory limit:	256 megabytes

You are given a matrix containing `n` rows and `m` columns, each cell contains `zero` or `one`. We call such a matrix `cool` if it does not have a single 2 by 2 square filled entirely with zeros or whole ones.

You have to determine is given matrix cool or not.

Input

In first line given `n, m` - size of matrix. $1 <= n, m <= 100$.

In the next `n` lines, on each there are `m` numbers which are 1 or 0.

Output

Print 'YES', if given matrix is cool, otherwise print 'NO'.

Examples

standard input	standard output
1 1 0	YES
4 4 1 0 1 0 1 1 1 0 0 1 0 1 0 0 0 0	YES
3 3 0 0 1 0 0 1 1 1 1	NO

Note

For example, a 4 by 4 matrix on the left is cool, and a 3 on 3 table on the right is not.

1	0	1	0
1	1	1	0
0	1	0	1
0	0	0	0

0	0	1
0	0	1
1	1	1

Problem E. Common characters

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

You are given a list of strings `A`. Print all characters that appears in all strings

Input

In the first line given `n` - number of strings.

In the next `n` lines given elements of array.

Output

Print all single common characters, if there are no common characters print NO COMMON CHARACTERS

Examples

standard input	standard output
3 bella label roller	e l
4 alik diyas ali dayana	a
3 aab ab c	NO COMMON CHARACTERS

Problem F. K-th common divisor

Input file:	standard input
Output file:	standard output
Time limit:	1 second
Memory limit:	256 megabytes

You are given positive integers A and B.

Find the K-th largest positive integer that divides both A and B.

The input guarantees that there exists such a number.

Input

You are given A, B, K respectively.

Output

Print the K-th largest positive integer that divides both A and B.

Examples

standard input	standard output
8 12 2	2
100 50 4	5
1 1 1	1

Note

Common divisors of (8, 12) are [1, 2, 4], so 2nd largest common divisor is 2

Problem G. Attendance pliz

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

Askar Agay, due to the fact that few students remain in practice, decided to take an attendance. He has a list of students who came to practice for November. Askar agay decided to add +1 points to all students who was in practice at least 3 three `different` days. Keep in mind that Askar Agay could take attendance on the same day several times!

Input

You are given list of attendance with `n` rows. Each row consist of `student name`, and `day of November`. It means student was in practice on that day.

Output

Print all students name, and if student was in practice at least 3 times print `+1`, otherwise print `NO BONUS`.

Examples

standard input	standard output
8 Aldiyar 2 Ermurat 2 Karina 9 Aldiyar 16 Karina 9 Karina 16 Aldiyar 23 Nadir 2	Aldiyar +1 Ermurat NO BONUS Karina NO BONUS Nadir NO BONUS
10 Gaziz 10 Azat 10 Madina 17 Madina 10 Nurzhan 23 Azat 10 Madina 3 Nurzhan 17 Azat 10 Madina 10	Azat NO BONUS Gaziz NO BONUS Madina +1 Nurzhan NO BONUS

Problem H. String shift

Input file:	standard input
Output file:	standard output
Time limit:	1 second
Memory limit:	256 megabytes

We have a string S consisting of uppercase English letters. Additionally, an integer N will be given.

Shift each character of S by N in alphabetical order (see below), and print the resulting string.

We assume that A follows Z. For example, shifting A by 2 results in C (A -> B -> C), and shifting X by 3 results in B (X -> Z -> A -> B).

$(0 \le N \le 26)$, $(1 \le |S| \le 10000)$.

Examples

standard input	standard output
2 ABCXYZ	CDEZAB
0 ABCXYZ	ABCXYZ
13 ABCDEFGHIJKLMNOPQRSTUVWXYZ	NOPQRSTUVWXYZABCDEFGHIJKLM

Note

DEC	ASCII	DEC	ASCII	DEC	ASCII	DEC	ASCII	DEC	ASCII	DEC	ASCII	DEC	ASCII	DEC	ASCII
1	☺	32	space	64	@	96	`	128	Ç	160	á	192	└	224	Ó
2	☻	33	!	65	A	97	a	129	ü	161	í	193	┴	225	ß
3	♥	34	"	66	B	98	b	130	è	162	ó	194	┬	226	Ô
4	♦	35	#	67	C	99	c	131	à	163	ú	195	├	227	Ò
5	♣	36	$	68	D	100	d	132	ä	164	ñ	196	—	228	õ
6	♠	37	%	69	E	101	e	133	à	165	Ñ	197	+	229	Õ
7	•	38	&	70	F	102	f	134	å	166	ª	198	ã	230	µ
8	◘	39	'	71	G	103	g	135	ç	167	º	199	Ã	231	þ
9	○	40	(	72	H	104	h	136	ê	168	¿	200	╚	232	Þ
10	◙	41	)	73	I	105	i	137	ë	169	®	201	╔	233	Ú
11	♂	42	*	74	J	106	j	138	è	170	¬	202	╩	234	Û
12	♀	43	+	75	K	107	k	139	ï	171	½	203	╦	235	Ù
13	♪	44	,	76	L	108	l	140	î	172	¼	204	╠	236	ý
14	♫	45	-	77	M	109	m	141	ì	173	¡	205	=	237	Ý
15	☼	46	.	78	N	110	n	142	Ä	174	«	206	╬	238	¯
16	►	47	/	79	O	111	o	143	Å	175	»	207	╧	239	´
17	◄	48	0	80	P	112	p	144	É	176	░	208	╨	240	≡
18	↕	49	1	81	Q	113	q	145	æ	177	▒	209	╤	241	±
19	‼	50	2	82	R	114	r	146	Æ	178	█	210	╥	242	‗
20	¶	51	3	83	S	115	s	147	ô	179	│	211	╙	243	¾
21	§	52	4	84	T	116	t	148	ö	180	┤	212	╘	244	¶
22	▬	53	5	85	U	117	u	149	ò	181	╡	213	╒	245	§
23	↨	54	6	86	V	118	v	150	û	182	╢	214	╓	246	÷
24	↑	55	7	87	W	119	w	151	ù	183	╖	215	╫	247	¸
25	↓	56	8	88	X	120	x	152	ÿ	184	╕	216	╪	248	°
26	→	57	9	89	Y	121	y	153	Ö	185	╣	217	┘	249	¨
27	←	58	:	90	Z	122	z	154	Ü	186	║	218	┌	250	·
28	∟	59	;	91	[	123	{	155	ø	187	╗	219	█	251	¹
29	↔	60	<	92	\	124			156	£	188	╝	220	▄	252	³
30	▲	61	=	93	]	125	}	157	Ø	189	¢	221	▌	253	²
31	▼	62	>	94	^	126	~	158	×	190	¥	222	▐	254	■
		63	?	95	_	127	⌂	159	ƒ	191	┐	223	▀	255	space

Problem I. ZA WARUDO TOKI WO TOMARE

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

DIO is fighting with JOJO. DIO wants to cast time stop, but for this DIO needs to find at least one palindrome in given string `s` by permutations of letters, help DIO, is he can cast ZA WARUDO TOKI WO TOMARE.

Input

You are given single string `s`.

Output

Print ZA WARUDO TOKI WO TOMARE, if given string could be palindrome permutation, otherwise print JOJO

Examples

standard input	standard output
`jojo`	`ZA WARUDO TOKI WO TOMARE`
`jojorefer`	`ZA WARUDO TOKI WO TOMARE`
`aabc`	`JOJO`
`asdasd`	`ZA WARUDO TOKI WO TOMARE`

Note

jojo possible palindrome -> jooj

jojorefer possible palindrome -> ejorfroje

Problem J. Closest point

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

You are given single point P in x,y coordinates system, and also list of **n** points.

You have to sort points by closest point to P.

Closest point - Ближайшая точка.

Input

In the first line given **x, y** coordinates of point P.

In the second line given **n**, number of points.

In the next **n** lines given **x,y** coordinates of each points.

Output

Print the array after sorting by closest point to P.

Examples

standard input	standard output
0 0 5 5 5 2 10 1 2 2 2 3 3	1 2 2 2 3 3 5 5 2 10
5 5 5 2 10 3 4 2 1 3 3 6 6	6 6 3 4 3 3 2 1 2 10
4 3 3 3 3 1 2 2 1	3 3 2 1 1 2

Note

Distance between two points determine by $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$