Problem A. Arithmetic

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

You are given an array of elements of size `N`.

You need to find the arithmetic mean of all even numbers at all odd indexes in array.

Output

Print the average value with 6 digits after decimal part

Examples

standard input	standard output
7 1 2 3 4 5 6 7	0
8 62 94 92 96 10 43 63 80	54.666667

Note

Array indexing starts with `1`.

[62, 92, 10] All even numbers placed at odd indexes in array.

Average value = (62+92+10)/3 = 54.666667

To print double with given precision write following code : cout « fixed « set precision(6) « d; where d is your answer

Problem B. Word size

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

You are given a text.

Print the length of each word in given text.

Example

standard input	standard output
Alik Ayana Dias Elvira	4 5 4 6

Problem C. Incomplete sorting

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

You are given matrix with n rows and m columns.

You have to sort each column of matrix in descending order.

Input

The first line consists of two integers n and m - number of rows and columns of matrix respectively.

Each of the next n lines contains m integers $d_{i,j}$ - elements of the matrix at the intersection of i_{th} row and j_{th} column.

Output

Print this matrix after sorting.

Examples

standard input	standard output
3 3 1 2 3 3 2 1 4 5 6	4 5 6 3 2 3 1 2 1
4 3 1 2 3 4 5 6 6 7 8 9 8 7	9 8 8 6 7 7 4 5 6 1 2 3

Problem D. DNA

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

As you know desoxyribonucleic acid consists of 4 nucleobases: adenine, guanine, cytosine, thymine. This nucleobases must form pairs: adenine with thymine and guanine with cytosine. You are given the sequence of nucleobases in the first part of DNA spiral. Please, find its second part.

Input

You are given the only string DNA. It is guaranteed that DNA consists only of uppercase letters 'A', 'C', 'T', 'G'.

Output

Print the second part of DNA spiral.

Examples

standard input	standard output
ACTG	TGAC
A	T
GTA	CAT

Problem E. Increases

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

You are given an integer number n. You need to print the matrix of size n x n as it is shown in sample tests.

Input

The only line of the input contains an integer n - size of the matrix.

Output

Print the matrix.

Examples

standard input	standard output
3	1 2 3 2 1 2 3 2 1
4	1 2 3 4 2 1 2 3 3 2 1 2 4 3 2 1
5	1 2 3 4 5 2 1 2 3 4 3 2 1 2 3 4 3 2 1 2 5 4 3 2 1

Problem F. Cities

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

Jonathan is a very curious boy. He has a list of countries and list of cities of each country. His task is for each city determining country where is located. But Jonathan doesn't know geography and needs your help.

Input

In the first line of the input given an integer n.

The next n lines given the name of country, count of cities k, and cities of of this country.

It is guaranteed that their names are unique.

In the next line given m - the number of names of cities which Jonathan asked.

The next m lines given names of cities.

Output

For each Jonathan's query - print country name, if we know in which country is located. Otherwise, print "Unknown".

Example

standard input	standard output
3 Kazakshtan 3 Kyzylorda Karaganda Uralsk USA 3 California Berkly New-York England 1 London 4 Kyzylorda New-York Atyrau Karaganda	Kazakshtan USA Unknown Kazakshtan

Problem G. Just Map

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

You are given names and you need to print the names of those whose repetition is an even number. Output names have to be printed in alphabetic order

Example

standard input	standard output
Ayana Ayana Dias Dias Dias Alik Alik Alik Alik	Alik Ayana

Problem H. Upper-Lower

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

You just need to make lowercase letters uppercase and Vice versa.

Input

string s.

Output

print answer.

Example

standard input	standard output
AliK	aLIk
AlI	aLi
DIAS	dias
AYANA	ayana
group	GROUP
FRIDAY	friday
ThE	tHe
BeSt	bEsT

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	é	162	ó	194	┬	226	Ô
4	♦	35	#	67	C	99	c	131	â	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	ð	240	
18	↕	49	1	81	Q	113	q	145	æ	177	▒	209	Ð	241	±
19	‼	50	2	82	R	114	r	146	Æ	178	▓	210	Ê	242	‗
20	¶	51	3	83	S	115	s	147	ô	179	│	211	Ë	243	¾
21	§	52	4	84	T	116	t	148	ö	180	┤	212	È	244	¶
22	▬	53	5	85	U	117	u	149	ò	181	Á	213	ı	245	§
23	↨	54	6	86	V	118	v	150	û	182	Â	214	Í	246	÷
24	↑	55	7	87	W	119	t	151	ù	183	À	215	Î	247	¸
25	↓	56	8	88	X	120	x	152	ÿ	184	©	216	Ï	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	Ì	254	■
		63	?	95	_	127	⌂	159	ƒ	191	┐	223	▀	255	space

Problem I. How many permutations?

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

You are given a string s. You need to remove all duplicate letters of this string, print the resulting string sorted in alphabetical order and also print the number of different permutations of resulting string.

Input

The only line of the input contains the string s.

Output

Print the resulting string on the first line and number of permutations on the second one.

Examples

standard input	standard output
abcabc	abc 6
cdbaaa	abcd 24

Problem J. Data compressing

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

You are given an array of size n. You need to assign each index from 1 to u for each distinct elememt of the array, where u is the amount of different numbers in the array. The less element is, the less its index.

Input

The first line of the input contains the only integer n - size of the array.

The second line contains n integers a_i - elements of the array.

Output

Print u lines. Each line must contain the index and the number that is assigned to this index. See samples for better understanding of the output.

Examples

standard input	standard output
5 8 4 2 5 9	1 2 2 4 3 5 4 8 5 9
5 3 5 2 5 3	1 2 2 3 3 5
10 1 1 2 2 1 2 1 2 2 1	1 1 2 2