

Q8. Decoding Morse Code (40 marks):

Morse code is a method used in telecommunications, named after Samuel Morse, which uses dots and dashes to encode text characters. The first step of the encoding process is to convert the text characters into a series of numbers using the ASCII code (please refer to page 3 for the ASCII code table). Then the series of numbers are represented by different combinations of dots and dashes, as shown in Figure Q8.

International Morse Code	
1	• — — — —
2	• • — — —
3	• • • — —
4	• • • • —
5	• • • • •
6	— • • • •
7	— — • • •
8	— — — • •
9	— — — — •
0	— — — — —

Figure Q8: Combinations of Morse Code for numbers

Let's assume that there are secret messages in a war that must be encoded into the Morse code before being transmitted to their own campsite. After the campsite receives an encoded message, it must decode the message into the original sentences.

For example, let the dot be represented by a full stop “.” and the dash be represented by a dash “-”. In test case 1, the campsite received a message of “--.....-----...-----.-...-----” which can be translated into 727984 using the Morse code. The ASCII code can then be used to further decode the numbers 727984 to obtain the original message “HOT” (72 is ‘H’, 79 is ‘O’ and 84 is ‘T’ as shown in the provided reference table).

Please note that sometimes, numbers and symbols are added to the message to prevent easy decoding by the enemy. Therefore, the numbers and symbols have to be removed before a sentence with only alphabet(s) and space(s) can be obtained (e.g., test case 2).

Write a programme to

Input a sequence of dots and dashes representing the encoded message. Note that there could be spaces (pauses) between the dots and dashes, and they represent the actual spaces inside the original message.

Output the interpreted message, which contains only alphabet(s) and space(s).

NOTE: The numbers and symbols, if any, have to be removed. After removing the numbers and symbols, if the interpreted message contains no alphabetical letter, then “No valid message” should be displayed.

Hint: The ASCII codes range involved are only from 33 to 126

试题 8. 解码莫尔斯电码（40 分）：

莫尔斯电码是一种用于电信的方法，以萨缪尔·摩尔斯命名。它使用点和横划以对文本字符进行编码。编码过程的第一步是使用 ASCII 码将文本字符转换为一系列数字（请参阅第 3 页的 ASCII 码对照表）。然后，按照图 Q8 的对应表，这一系列数字可由点和横划的不同组合来表示。

International Morse Code	
1	• — — — —
2	• • — — —
3	• • • — —
4	• • • • —
5	• • • • •
6	— • • • •
7	— — • • •
8	— — — • •
9	— — — — •
0	— — — — —

图 Q8：数字的摩尔斯电码组合

假设在一场战争中，某军队在传送机密的信息回营地前，都必须把信息编码成摩尔斯电码。当营地收到电码后，必须把电码再解码还原成原来的句子。

例如，假设我们可以使用句号“.”来表示点，以及破折号“-”来表示横划。在测试用例 1 中，营地收到一条信息 “--.....-----...-----.....-”，使用摩尔斯电码可将其翻译为 727984。然后再用 ASCII 码把 727984 这一串数字进一步解码为“HOT”（72 为 'H'，79 为 'O'，84 为 'T'，如提供的参考表所示）。

请注意，为了防止敌人容易破解，军方有时会在信息中添加数字和符号。解码后，这些数字和符号必须被删除，以获得只有英文字母和空格的句子（例如测试用例 2 的例子）。

试写一程式以

输入 代表了编码信息的一系列的点和横划。请注意，点和横划之间可能有空格（停顿），它们代表了原信息中的实际空格。

输出 解码后的信息，且此信息只包含了英文字母和空格。

注意：如有数字和符号，它们必须被删除。如果删除数字和符号之后，被解码出的信息不包含任何英文字母，则应显示 “No valid message”。

提示：ASCII 码的涉及范围只是从 33 到 126。

Example (例子)

Input (输入)	Output (输出)
<pre> - - - - - - . . - - - . - - - </pre>	HOT
<pre> - - - - - - - . - - - . . - . . - - . . </pre>	I aM
<pre> . . . - - - - - - - - - - . . . - - - - - - - . . . - - - - - - - - - - - . . . - - - . </pre>	No valid message
<pre> - . . . - - - - - - - - - . . . - - . . . - . - - - - . . . </pre>	a BOY
<pre> - - - - . - - - . - - - - - - - - - . - . . . - . . . - - . . . - - - - - - . . . </pre>	baD BOY

Reference / 参考: ASCII Codes Table / ASCII 码对照表

32	space	64	@	96	`
33	!	65	A	97	a
34	"	66	B	98	b
35	#	67	C	99	c
36	\$	68	D	100	d
37	%	69	E	101	e
38	&	70	F	102	f
39	'	71	G	103	g
40	(	72	H	104	h
41	)	73	I	105	i
42	*	74	J	106	j
43	+	75	K	107	k
44	,	76	L	108	l
45	-	77	M	109	m
46	.	78	N	110	n
47	/	79	O	111	o
48	0	80	P	112	p
49	1	81	Q	113	q
50	2	82	R	114	r
51	3	83	S	115	s
52	4	84	T	116	t
53	5	85	U	117	u
54	6	86	V	118	v
55	7	87	W	119	w
56	8	88	X	120	x
57	9	89	Y	121	y
58	:	90	Z	122	z
59	;	91	[	123	{
60	<	92	\	124	|
61	=	93	]	125	}
62	>	94	^	126	~
63	?	95	_		

*Source: <https://computersciencewiki.org/index.php/ASCII>