

The Huffman Decoder (Coding)

A fragment of text is picked up from Wikipedia. Each distinct character in this fragment is then assigned a unique numeric code using a [Huffman](#) encoding scheme. Huffman codes are used for compressing text by giving the characters with the highest occurrence frequency the shortest possible code. One requirement of such encoding schemes is that no code can be a prefix of another. For instance, it is not possible for us to encode the letter 'a' as 01 and then encode 'b' as 011.

Task

Given the dictionary of the encoding scheme and the compressed encoded version of the Wikipedia text fragment, recover the original text.

Input Format

- The first input line contains an integer ***N***, the number of characters in the Huffman dictionary.
- Each of the next ***N*** lines contains a character ***c***, followed by a tab, followed by the character's Huffman encoding, a sequence of ones and zeroes. The newline character '***\n***' is a special case, which will be represented by the string [newline] in the dictionary.
- Finally there is a single line which is the encoded version of the text, based on the encoding dictionary.

Constraints

- $1 \leq N \leq 100$
- The original text will contain no more than 7,000 characters.

Output Format

The original block of text. Please note that it may contain more than one line.

Constraints

$1 \leq N \leq 100$

The text fragments used will not exceed 5,000 characters.

Sample Input

```
54
[newline]      010100
2      010101
4      010110
9      010111
:      011000
G      011001
K      011010
M      011011
V      011100
j      011101
q      011110
1      011111
6      100000
B      100001
C      100010
I      100011
W      100100
x      100101
"      100110
5      100111
8      101000
E      101001
F      101010
k      101011
R      101100
S      101101
0      101110
A      101111
L      110000
-      110001
.      110010
,      110011
v      110100
b      110101
p      110110
g      110111
w      111000
y      111001
m      111010
f      111011
u      111100
c      111101
s      111110
```

h 111111
d 00000
l 00001
r 00010
i 00011
o 00100
a 00101
n 00110
t 00111
e 01000
01001

1001000001100111111111010010011111111101000010011111010010000001000010
01011101101111110010000100100100111011010011011000010011101000101001100
1001000101111000000101000010010001100110010010011111111101000010010100
000101000100000111100101001100111001111111101001111101010000011000111
1111000001011100111001101001110000001000011000000001000011001001111101
0100000101111110010000000001001001110010001001110101010000100100101010
0111110100101110110000110011100101000010100100101001100000001001001111
111110100001001111000001010000100001010000000001001111101000110011111
00101001001001110110100111000000100001100000000001100110000111111001110
100100111100000101111110010010100011101111011010001111010011100011110
1000100000001111001010010010111010100101001100000000100001100100000000
1100110100100101000010011111111100100111100110111111111010011011000010
0111010001010011001001111101000111101000001100001000111111100010100111
0001100100001100100111111111110000110110111010010010000110010010001100
1100100100111111111010000100110110100111010010110110010100010001110001
1001101100010001100110110001001111111110100011000110101000011010000000
1000001111100100100101000100100000101010011111000011000111000110000101
0010010100010001001111000011000000010010101101001111011101100100100110
1010000100010011101001001001010001000100111100001100000001001100111101
1101011101100110100100101001100100111011100110110111000010010011000110
1101001011001010010000110010011111100100000111001110000101000111010010
0000110001110100110101100110001001110000011001001001011111100100111000
0111100001100000001000001101110000001111110101001000000100011010001000
0000100100110110010000000001001000110011001001001111111110100001001111
11000101111101001000010010010100010010000010111001101001111110000010001
11101111111110011110000111100101001001110010001001001111111110100001001
11100001000111110001110100100100111011010010011111111110100001001001000
0001000000100110110000100111010001010011001001111101000110011111100111
0010010011000011110010100100101110101001001111000011101001100000101000
1011101100110100100011001110100111111100101000000100100010010001101000
0011110100010000000001001111110111100111011111011000111111010001101000
0011000111000011110010100100111001000100111010101000111101001001110100
1000010010010101001111010001010111010010000010010011101100010000010001
11110011010010010100001001111111110010011110011011111111110100100111111
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1001010001101000001100000010000011011110101000010010010011101101001000
0100101000101101110100011000111111011110100101000010100001001110110000
1000100000001111001111010011100011001000011001001001001110110100111011
1001000010000000111110110010011010100001000100111010010010011111111

1010000100110100001010110111011110010010011111110100001001001110010
0111000001100100100000010001111010000100011001100100000000010011101010
1000111101001011111001111100100001001001001110110100100010010001101100
1000001010011101000000000100101110000011101011000110011011011101001001
010011100111001011111011010111111011001101001001010011000000010010011
1111111010000100110111100110110111000010010011000110110100101100101001
0000110010011000101111110001000100001100001111110100001010000100100010
010001111010010000010000000100000000010010011111111001010011101001000
1100111010011110000010111111001001100110000100100011101100100111100001
10000000010000000010011001001110101111001010011011110000111101100010010
00000000010010011111111101000010010110010001001000001010011101001000110
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0001000000100100110111000111111010010100001010010001001000111110010000
01010001011110111111010011111011111100100111000111110010010011111111
100101001110100100111111111000111111001001000110011011010000100000011
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1000111010010010011101101001110000111100001100000001000001101110000001
1111101010010010100110000000100100101010010001001000110100000111101000
0101000010100100100111011010010000100011111011010000100100101001100000
001001001110001000101000000100001001111000000110011111111000110011001
0010011111111101000010010010000001000000100110110000100111010001010011
0010011110000010100001000011111101100100100111000000100001100000000100
0011001001001111111110100000110010011101110001001000111000010011111100
0001001001110000000111100101001111100001100011100011000010100100101110
1010010011110000111010010101111001111011101100110100100101111011001110
100000010010011110001111110001111110111111010010010111110100111000111
1010000011001111110010100100011001101111010001001000001011111100100000
0000100100000000100010111101000101001110001111110100101000010000111100
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1110100111110101000001100011111110000010111001110011010011100000010000
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1000000010010010100001000010100111110100100111010110110001010001000011
1111100010000110010010011111111101000010010000100101000101101110100011
1110001110100100111001001110000011001001000110011001001101001001101101
1100001001010011000000110010010011001000100011111000111111010000110011
0111110001110100000010010011011111101011101010100011100111001101001000
1001000110101111100000110000100111010010001100110010010011111111101000
0100110110000100111010001010011001000111110011110111100010000100111111
0001111110010000101000010011101011110010100101101000011001101101110100
1101001000001110000010100010000000100100111111111010000100110001000100
0011011101101000111110111110001000001011001101001111000001011111100100
1001000011001000010010010011101101001001111111110100001001110111000100
010100110000000100011111100011101001111101111111110000010111101111111
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0100111010101000010000011001001001111111110100001001111101001011101100
0011001110010100001010010010011101101001101111001101101110000100100110
0011011010010110010100100001100100110100100110110111000010010100110000
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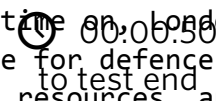
```
1110001111111001001001110001111101001000010010010000110110011010011100
0000100001100000000100001100100111010101000111101001011110100100001001
0011111111101000010011110100010100011001100100111101100100000101111001
1101001001111011001000001001001111011001000001001000000111101110011001
0010011100010001010000001000000101111100100100101001100000001001001111
1111101000010011101010010111111001000010011110110010000010010010000001
0001110110100000110111101010000100100011001100100100111000111110100100
0010010010011101101001111000001010001011001001001100011001100100100111
1111110100001001110100000110100011100001001001001110110100110101000010
00101001110101011010011011010011101000001100011100100001100110000100110
011010001100111010011111110010100000010010011111111010000100100010010
0011111000100111100000101111010100011111011001101001001010011000000010
0100011001110100111100000101111110010010001000101110110000110000000001
1110010100100000010001101000100000001001001101100001100110110111010010
0111111111010000100100000000111101110011000011001111110010100100101001
10000000100100111111111010000100111011000100000010001100111100011111101
0010100001010011111100100000001111011110001111101001000011011111011110
10001100100111110011111000110010001111101111100100100101110110110110000
1000100110110000100001100101001110100001001001110010001001001010100100
1100010100111000110010000110001010000101001111101001011101100001100111
0010100001110010100110010100
```

Sample Output

With the collapse of Roman rule in the early 5th century, London ceased to be a capital and the walled city of Londinium was effectively abandoned, although Roman civilisation hung on in the St Martin-in-the-Fields area until around 450. From around 500, an Anglo-Saxon settlement known as Lundenwic developed in the same area, slightly to the west of the old Roman city. By about 680, it had revived sufficiently to become a major port, although there is little evidence of large-scale production of goods. From the 820s the town declined because of repeated Viking attacks, and the Anglo-Saxon Chronicle recorded that it was "refounded" by Alfred the Great in 886. Archaeological research shows that this involved abandonment of Lundenwic and a revival of life and trade within the old Roman walls. London then grew slowly until about 950, after which activity increased dramatically. By the 11th century, London was beyond all comparison the largest town in England. Westminster Abbey, rebuilt in the Romanesque style by King Edward the Confessor, was one of the grandest churches in Europe. Winchester had previously been the capital of Anglo-Saxon England, but from this time on, London became the main forum for foreign traders and the base for defence in time of war. In the view of Frank Stenton: "It had the resources, and it was rapidly developing the dignity and the political self-consciousness appropriate to a national capital."



Qumulo Coding Quiz



00:00:50

to test end

Explanation

Consider the first word of the text (and the space which follows it) "With ". From the encoding dictionary 'W', 'i', 't', 'h' and ' ' correspond to '100100','00011','00111','11111','01001' respectively. So, the encoded version of the text begins with: 100100000110011111111101001.

YOUR ANSWER

Draft saved 06:17 am

Java



[Click here](#) to know how to read from STDIN and write to STDOUT



```
1 ▼ import java.io.*;
2 import java.util.*;
3 import java.text.*;
4 ▼ public class Solution {
5 ▼     public static void main(String args[] ) throws Exception {
6         /* Enter your code here. Read input from STDIN. Print
           output to STDOUT */
7         Scanner sc = new Scanner(System.in);
8
9         HashMap<String,String> huffMap = new
           HashMap<String,String>();
10
11
12         int N = Integer.parseInt(sc.nextLine());
13         while(N!=0)
14 ▼     {
15         String data[]=sc.nextLine().split("\t");
16         String ch = data[0];
17         String hcode = data[1].trim();
18         if(ch.equals("[newline]"))
19             huffMap.put(hcode, "\n");
20         else
21             huffMap.put(hcode, ch);
22
23         --N;
24     }
25     String encodedText = sc.nextLine();
```

```

26         StringBuilder sb = new StringBuilder(0);
27         for(int i=0;i<encodedText.length();i++)
28     {
29             sb.append(encodedText.charAt(i));
30             String hcode = sb.toString();
31             if(huffMap.containsKey(hcode))
32     {
33                 System.out.print(huffMap.get(hcode));
34                 sb.setLength(0);
35             }
36         }
37     }
38 }


```

Line: 1 Col: 1

☐ Test against custom input

Run Code

Submit code & Continue

 Download sample testcases *The input/output files have Unix line endings. Do not use Notepad to edit them on windows.*

Status: Compiled successfully. All available test cases passed!

Testcase 1: Success

Your Output

Calcutta (now Kolkata) was the capital of India during the British Raj until December 1911. However, Delhi had served as the political and financial centre of several empires of ancient India and the Delhi Sultanate, most notably of the Mughal Empire from 1649 to 1857. During the early 1900s, a proposal was made to the British administration to shift the capital of the British Indian Empire (as it was officially called) from Calcutta to Delhi. Unlike Calcutta, which was located on the eastern coast of India, Delhi was located in northern India and the Government of British India felt that it would be easier to administer India from Delhi rather than from Calcutta. On 12 December 1911, during the Delhi Durbar, George V, the then Emperor of India, along with Queen Mary, his Consort, made the announcement that the capital of the Raj was to be shifted from Calcutta to Delhi, while laying the foundation stone for the Viceroy's residence in the Coronation Park, Kingsway Camp. The foundation stone

of New Delhi was laid by King George V and Queen Mary at the site of Delhi Durbar of 1911 at Kingsway Camp on 15 December 1911, during their imperial visit. Large parts of New Delhi were planned by Edwin Lutyens (Sir Edwin from 1918), who first visited Delhi in 1912, and Herbert Baker (Sir Herbert from 1926), both leading 20th-century British architects. The contract was given to Sobha Singh (later Sir Sobha Singh). Construction really began after World War I and was completed by 1931. The city that was later dubbed "Lutyens' Delhi" was inaugurated in ceremonies beginning on 10 February 1931 by Lord Irwin, the Viceroy. Lutyens designed the central administrative area of the city as a testament to Britain's imperial aspirations. The 1931 series celebrated the inauguration of New Delhi as the seat of government. The one rupee stamp shows George V with the "Secretariat Building" and Dominion Columns. Soon Lutyens started considering other places. Indeed, the Delhi Town Planning Committee, set up to plan the new imperial capital, with George Swinton as chairman and John A. Brodie and Lutyens as members, submitted reports for both North and South sites. However, it was rejected by the Viceroy when the cost of acquiring the necessary properties was found to be too high. The central axis of New Delhi, which today faces east at India Gate, was previously meant to be a north-south axis linking the Viceroy's House at one end with Paharganj at the other. During the project's early years, many tourists believed it was a gate from Earth to Heaven itself. Eventually, owing to space constraints and the presence of a large number of heritage sites in the North side, the committee settled on the South site. A site atop Raisina Hill, formerly Raisina Village, a Meo village, was chosen for the Rashtrapati Bhawan, then known as the Viceroy's House. The reason for this choice was that the hill lay directly opposite the Dinanah citadel, which was also considered the site of Indraprastha, the ancient region of Delhi. Subsequently, the foundation stone was shifted from the site of Delhi Durbar of 1911 to 1912, where the Coronation Pillar stood, and embedded in the walls of the forecourt of the Secretariat. The Rajpath, also known as King's Way, stretched from the India Gate to the Rashtrapati Bhawan. The Secretariat building, the two blocks of which flank the Rashtrapati Bhawan and house various ministries of the Government of India, and the Parliament House, both designed by Herbert Baker, are located at the Sansad Marg and run parallel to the Rajpath.

In the south, land up to Safdarjung's Tomb was acquired in order to create what is today known as Lutyens' Bungalow Zone. Before construction could begin on the rocky ridge of Raisina Hill, a circular railway line around the Council House (now Parliament House), called the Imperial Delhi Railway, was built to transport construction material and workers for the next twenty years. The last stumbling block was the Agra-Delhi railway line that cut right through the site earmarked for the hexagonal All-India War Memorial (India Gate) and Kingsway (Rajpath), which was a problem because the Old Delhi Railway Station served the entire city at that time. The line was shifted to run along Yamuna river, and it began operating in 1924. The

New Delhi Railway Station opened in 1926 with a single platform at Ajmeri Gate near Paharganj and was completed in time for the city's inauguration in 1931. As construction of the Viceroy's House (the present Rashtrapati Bhavan), Central Secretariat, Parliament House, and All-India War Memorial (India Gate) was winding down, the construction of a shopping district and a new plaza, Connaught Place, began in 1929, and was completed by 1933. Named after Prince Arthur, 1st Duke of Connaught (1850-1942), it was designed by Robert Tor Russell, chief architect to the Public Works Department (PWD). After the capital of India moved to Delhi, a temporary secretariat building was constructed in a few months in 1912 in North Delhi. Most of the government offices of the new capital moved here from the 'Old secretariat' in Old Delhi (the building now houses the Delhi Legislative Assembly), a decade before the new capital was inaugurated in 1931. Many employees were brought into the new capital from distant parts of India, including the Bengal Presidency and Madras Presidency. Subsequently housing for them was developed around Gole Market area in 1920s. Built in 1940s, to house government employees, with bungalows for senior officials in the nearby Lodhi Estate area, Lodhi colony near historic Lodhi Gardens, was the last residential areas built by the British Raj.

Expected Output

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Testcase 2: Success

Your Output

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Expected Output

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Testcase 3: *Success*

Your Output

Output hidden

Testcase 4: *Success*

Your Output

Output hidden

Testcase 5: *Success*

Your Output

Output hidden

Testcase 6: *Success*

Your Output

Output hidden

Testcase 7: *Success*

Your Output

Output hidden