Time Traveling Day Trader | 2 point(s)

This problem is inspired by the movie [Primer](https://en.wikipedia.org/wiki/Primer_(film)). Two people have accidentally just invented a time travel device. The startup they have been trying to launch together hasn't quite taken off yet, so they decide that a quick way to raise capital would be to use the time travel device to make sure bets in the stock market.

Their plan is simple. Over the course of a day, they will monitor a number of stocks in the stock market and record their movements every hour. At the end of the day, they will use the time machine to travel back to the beginning of the day. Equipped with certain knowledge of the future, they will be able to trade in the stock market optimally - and hopefully make lots of money!

In order to avoid suspicion, the two agree to hold only one share of stock at a time, and they agree to invest in only one stock throughout the day, since it's more believable that they got lucky on one stock than on many. Because they start with a finite amount of cash, they cannot buy a stock until its share price is less than or equal to the amount they have (including any profits they've made so far). Finally, if they enter the last hour of the day holding a share of stock, they decide it would be best to sell it to avoid any losses in after-hours trading.

Your task is to determine what one stock they should trade and on what hours of the day to buy, hold, and sell it. The goal is to maximize total profit throughout the day, subject to the above constraints.

Input definition

The input will contain an arbitrary number of lines. The first line will show the initial amount of money held at the beginning of the day, written in currency format with no dollar sign (for example, 19.50). The second line will be a list of hours of the trading day, in 24-hour format.

Each of the remaining lines will be separated into a number of columns. The first column will be the ticker symbol of a stock. After that, for each hour of the day there will be a column containing the price of that stock at the corresponding hour, also in currency format with no dollar sign.

Output definition

Your output should contain exactly four lines:

1. The ticker symbol of the stock you will choose in all caps
2. The amount of cash you end the day with in currency format with no dollar sign
3. A list of the hours of the trading day in 24-hour format (you might not be able to simply reprint the list that was in the input)
4. Under each hour of the day, print the following:
   * "B" if you should buy the stock on that hour
   * "S" if you should sell the stock on that hour
   * "." if you are holding the stock during that hour
   * Nothing (whitespace) if none of the above apply

The alignment of your output is important; in particular, non-trailing whitespace must match the expected solutions to receive credit. Your ouput's third line should contain four spaces after each one-digit hour and three spaces after each two-digit hour. The fourth line's text should be aligned with the hours. You are strongly encouraged to use the practice inputs to ensure your output alignment is correct.

Example input

100.00

8 9 10 11 12 13 14 15 16

ABCD 400.00 412.10 410.33 399.98 401.10 408.07 409.79 410.22 408.80

ABDC 90.10 90.00 89.79 90.02 91.55 91.96 93.04 93.09 92.99

BCAD 42.22 43.20 45.10 39.99 39.20 48.21 50.03 47.45 46.38

Example output

BCAD

113.71

8 9 10 11 12 13 14 15 16

B . S B . S