Price Change Alert

Write a program that **tracks stock prices** and **gives updates** about the **significance in each price change**. Based on the significance, there are **four kinds of changes**: no change at all (price is equal to the previous), minor (difference is below the significance threshold), price up and price down.

Input

- On the first line you are given the **number of prices**
- On the second line you are given the **significance threshold**
- On the next N lines, you are given **prices**

Output

- Don't print anything for the first price
- If there is **no difference** from the previous price the output message is: "NO CHANGE: {current price}"
- In case of **minor change**: "MINOR CHANGE: {last price} to {current price} ({difference}%)"
- In case of **major change**: "PRICE UP: {last price} to {current price} ({difference}%)" or "PRICE DOWN: {last price} to {current price} ({difference}%)"

The percentage should be rounded to the second digit after the decimal point.

Examples

Input	Output
3 0.1 10 11 12	PRICE UP: 10 to 11 (10.00%) MINOR CHANGE: 11 to 12 (9.09%)
3 0.1 10 10 12	NO CHANGE: 10 PRICE UP: 10 to 12 (20.00%)