Problem 7

Change for a Peso?

6 Points

Program Name: change.cpp **Input File: change.dat**

It is common for U.S. citizens travelling abroad to have to spend U.S. dollars in shops, restaurants and with street vendors. However, it is very common that the ratios of the denominations that the U.S. citizen has in dollars will not match the denominations that the person in the foreign country has in his country's monetary units. Your program is supposed to help people from the U.S. who are visiting Mexico. Your program is given the following data:

- the numbers of pennies, nickels, dimes, quarters, $1 bills, and $5 bills possessed by the U.S. citizen,
- the numbers of 1 new peso(NP), 2 NP, 5 NP coins and the numbers of 10, and 20 new pesos bills possessed by the local vendor in Mexico, and
- the value in U.S. cents of 1 new peso.

The U.S. citizen who is visiting Mexico is seeking to purchase the largest number of New Pesos that he can but without any loss to himself or the vendor due to rounding errors. So, the goal of your program is to determine the **maximum** number of U.S. dollars that can be exchanged equitably with the vendor. It may be possible that the U.S. citizen has $11 that he can exchange for 68NP. But, if the vendor happens to have correct NP denominations to make change for $27, the visitor will make the $27 exchange.

Input

Input to your program consists of a series of lines of input that each describe a potential exchange. Each line of input contains the values in Table 4 below. There are no errors or extraneous input in the input file.

Field Name	Value Range	Columns	Description
# pennies	0-5	1	Number of pennies that the U.S. visitor possesses.
# nickels	0-5	3	Number of nickels that the U.S. visitor possesses.
# dimes	0-5	5	Number of dimes that the U.S. visitor possesses.
# quarters	0-5	7	Number of quarters that the U.S. visitor possesses.
# $1 bills	0-5	9	Number of $1 bills that the U.S. visitor possesses.
# $5 bills	0-5	11	Number of $5 bills that the U.S. visitor possesses.
# 1 NP coins	0-5	13	Number of 1 NP coins that the vendor possesses.
# 2 NP coins	0-5	15	Number of 2 NP coins that the vendor possesses.
# 5 NP coins	0-5	17	Number of 5 NP coins that the vendor possesses.
# 10 NP bills	0-5	19	Number of 10 NP bills that the vendor possesses.
# 20 NP bills	0-5	21	Number of 20 NP bills that the vendor possesses.
Value of a NP	1-999	23-25	Value of a New Peso in U.S. cents.

Table 4 : Format of the Input File

Output

For each input line, your program should print the maximum amount of U.S. dollars and cents that can be equitably exchanged between the visitor and vendor on a line by itself. The dollar sign (required) should appear in column 1 immediately followed by the dollars and cents (d.cc format). See the sample output for an illustration of the required output format. If there is no combination of the U.S. and Mexican monetary denominations that can be exchanged, your program should print the message "No monetary exchange" starting in column 1. Your program should not contain any extraneous output including embedded blanks or blank lines. Note that your program will have only 2 minutes to solve all of the input file. (The exhaustive solution written for the judges easily meets this requirement on a 200 MHz Pentium.)

Example: Input File

```
4 5 5 5 5 0 3 3 3 0 0 016
5 5 5 5 5 5 5 5 5 5 5 045
1 1 1 1 1 1 1 1 1 1 1 019
4 3 5 0 3 2 5 3 5 2 3 123
```

Output to screen

```
$3.84
$31.95
No monetary exchange
$13.53
```