

Problem 140: Where's My Change?

Difficulty: Medium

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Problem Background

An automated teller machine (ATM) is an electronic banking device that allows customers to complete basic banking transactions like deposits or withdrawals without the aid of a human teller. Anyone with a credit or debit card can access most ATMs. The first ATM appeared in London in 1967; in just over 50 years, they have spread throughout the globe, with more than 3.5 million ATMs installed worldwide.

Problem Description

Your team is working with a bank that wants to deploy new ATMs throughout their banking network. While most ATMs will only dispense money in one denomination, the bank wants their new ATMs to be more flexible, dispensing cash in any legal denomination. They believe that this will allow their bank to dominate the ATM business by better addressing customer's needs.

Your team has been hired to develop the algorithm that determines how much change to dispense to each customer. The ATMs will be deployed in the United States, and so can dispense bills in denominations of \$100, \$50, \$20, \$10, \$5, \$2, and \$1, and coins in denominations of \$0.25, \$0.10, \$0.05, and \$0.01. Your algorithm should direct the ATM to dispense the smallest number of individual bills and coins necessary to fulfill the customer's request. For example, if a customer requests \$5.01, you should dispense one \$5 bill and one \$0.01 coin to meet that total. An order of \$51.27 would require one \$50 bill, one \$1 bill, one \$0.25 coin, and two \$0.01 coins.

Sample Input

The first line of your program's input, received from the standard input channel, will contain a positive integer representing the number of test cases. Each test case will include a decimal value representing the amount of money a customer would like to withdraw from their bank account.

5
5.01
51.27
10.89
27.08
102.30

Sample Output

For each test case, your program must print a single line indicating the amount of each denomination of money to dispense to the customer. For each denomination, in the order listed below, print a single integer representing the amount of that denomination to dispense. You will never be required to dispense more than 9 items of a single denomination.

- \$100
- \$50
- \$20
- \$10
- \$5
- \$2
- \$1
- \$0.25
- \$0.10
- \$0.05
- \$0.01

00001000001
01000011002
00010003104
00101100013
10000101010