assignment Requirements for Multi-Currency Vending Machine

Personal Software Process for Engineers

# Program Requirements

Extend the change-making program to provide the functions of a multiple-currency vending machine. Your program should accept initial input of

* a supply list of bills and coins for multiple currencies
* currency exchange rate information
* a list of available goods and their purchase prices in U.S. dollars

Assume that the currencies available are

* U.S. dollars
* Japanese yen
* British pounds

The vending machine should

* accept money in any of the available currencies and make that the active currency
* dispense an item and provide change if sufficient money has been inserted and if there is an adequate supply of bills and coins to provide change in the active currency
* if sufficient money has not been inserted, ask for more money
* if change cannot be made, ask the user to switch the active currency and try again
* continuously display the balance in the active currency (using U.S. dollars until another currency is selected)

Your program should calculate change by using the largest available bills and coins.

The vending machine should

* maintain supply lists of bills and coins for each currency, based on the amount tendered and the change provided in that currency
* upon a user’s request, report the current supply of bills and coins in the active currency

Thoroughly test the program. At a minimum, test your program with the following three test cases. Assume each test case starts with the initial data in the tables below.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Price List (in U.S. Dollars) | |  | Exchange Rates (Relative to USD) | | |
| Drink | $1.50 |  | U.S. dollar | USD | 1.0000 |
| Potato chips | $2.25 |  | Japanese yen | JPY | 118.87 |
| Chocolates | $9.95 |  | British pound | GBP | 0.6844 |
| Water | $1.05 |  |  |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| U.S. Dollars | | |  | Japanese Yen | | |
| Description | Value | Quantity |  | Description | Value | Quantity |
| $100 bill | 100 | 0 |  | 10000 yen bill | 10000 | 0 |
| $50 bill | 50 | 0 |  | 5000 yen bill | 5000 | 0 |
| $20 bill | 20 | 0 |  | 2000 yen bill | 2000 | 0 |
| $10 bill | 10 | 1 |  | 1000 yen bill | 1000 | 0 |
| $5 bill | 5 | 2 |  | 500 yen coin | 500 | 0 |
| $1 bill | 1 | 6 |  | 100 yen coin | 100 | 0 |
| quarter | 0.25 | 2 |  | 50 yen coin | 50 | 2 |
| dime | 0.10 | 6 |  | 10 yen coin | 10 | 7 |
| nickel | 0.05 | 0 |  | 5 yen coin | 5 | 0 |
| penny | 0.01 | 10 |  | 1 yen coin | 1 | 5 |

|  |  |  |
| --- | --- | --- |
| Great Britain Pounds | | |
| Description | Value | Quantity |
| 100 pound note | 100 | 0 |
| 50 pound note | 50 | 0 |
| 20 pound note | 20 | 0 |
| 10 pound note | 10 | 0 |
| 5 pound note | 5 | 0 |
| 2 pound coin | 2 | 0 |
| 1 pound coin | 1 | 0 |
| 50p coin | 0.50 | 0 |
| 20p coin | 0.20 | 0 |
| 10p coin | 0.10 | 0 |
| 5p coin | 0.05 | 0 |
| 2p coin | 0.02 | 0 |
| 1p coin | 0.01 | 0 |

# Test Case 1

Use the information in the table below as input for Test Case 1.

|  |
| --- |
| User Input |
| GBP 1 pound note |
| Drink |
| GBP 5p coin |
| Drink |
| USD |
| Drink |
| Report |
| GBP |
| Report |

## Test Case 1 – Expected Results

For Test Case 1, your program should produce the results below in any similar format.

|  |  |  |
| --- | --- | --- |
| User Input | Current Balance | Output |
| GBP 1 pound note | GBP 1.00 |  |
| Drink | GBP 1.00 | Not enough money tendered |
| GBP 5p coin | GBP 1.05 |  |
| Drink | GBP 1.05 | No change available |
| USD | USD 1.53 |  |
| Drink | USD 0.00 | Purchase is USD 1.50  Tendered is USD 1.53  Change is USD 0.03  3 pennies |
| Report | USD 0.00 | USD  1 $10 bill  2 $5 bills  6 $1 bills  2 quarters  6 dimes  7 pennies |
| GBP | GBP 0.00 |  |
| Report | GBP 0.00 | GBP  1 1 pound coin  1 5p coin |

# Test Case 2

Use the information in the table below as input for Test Case 2.

|  |
| --- |
| User Input |
| JPY 100 yen coin, two 10 yen coins, 5 yen coin |
| Water |
| JPY 100 yen coin |
| GPB 5 pound note |
| USD two 1 dollar bills |
| Chocolate |
| Report |
| JPY |
| Report |
| GBP |
| Report |

## Test Case 2 – Expected Results

For Test Case 2, your program should produce the results below in any similar format.

|  |  |  |
| --- | --- | --- |
| User Input | Current Balance | Output |
| JPY 100 yen coin, two 10 yen coins, 5 yen coin | JPY 125 |  |
| Water | JPY 0 | Purchase is JPY 125.00  Tendered is JPY 125.00  Change is JPY 0 |
| JPY 100 yen coin | JPY 100 |  |
| GPB 5 pound note | GBP 5.58 |  |
| USD two 1 dollar bills | USD 10.15 |  |
| Chocolate | USD 0.00 | Purchase is USD 9.95  Tendered is USD $10.15  Change is USD 0.20  2 dimes |
| Report | USD 0.00 | USD  1 $10 bill  2 $5 bills  8 $1 bills  2 quarters  4 dimes  10 pennies |
| JPY | JPY 0 |  |
| Report | JPY 0 | JPY  2 100 yen coins  2 50 yen coins  9 10 yen coins  1 5 yen coin  5 1 yen coins |
| GBP | GBP 0.00 |  |
| Report | GBP 0.00 | GBP  1 5 pound note |

# Test Case 3

Use the information in the table below as input for Test Case 3.

|  |
| --- |
| User Input |
| USD 1 dollar bill |
| JPY 100 yen coin |
| Drink |
| JPY 500 yen coin |
| Potato chips |
| Report |
| USD |
| Report |

## Test Case 3 – Expected Results

For Test Case 3, your program should produce the results below in any similar format.

|  |  |  |
| --- | --- | --- |
| User Input | Current Balance | Output |
| USD 1 dollar bill | USD 1.00 |  |
| JPY 100 yen coin | JPY 219 |  |
| Drink | JPY 0 | Purchase is JPY 178  Tendered is JPY 219  Change is JPY 41  4 10 yen coins  1 1 yen coin |
| JPY 500 yen coin | JPY 500 |  |
| Potato chips | JPY 0 | Purchase is JPY 267  Tendered is JPY 500  Change is JPY 233  1 100 yen coin  2 50 yen coins  3 10 yen coins  3 1 yen coins |
| Report | JPY 0 | JPY  1 500 yen coin  1 1 yen coin |
| USD | USD 0.00 |  |
| Report | USD 0.00 | USD  1 $10 bill  2 $5 bills  7 $1 bills  2 quarters  6 dimes  10 pennies |

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