```
/*
 This program determines the amount of change that is given back to the user
 in the form of dollars and coins.

 Currently only outputting change at a fixed rate, not based on user's desire.

 For example:
 $50 -> 1 $50 Bill
 NOT:
 $50 -> 2 $20 Bills, 1 $5 Bill, and 5 $1 Bills
*/

#include<iostream>
#include"coin_counter.h"

using namespace std;

int main(void)
{
    counter user;
    float moneyRequested = 0;   // Change wanted by user

    /* Asking the user what change they want */
    while(true)
    {
        cout << "Amount needed: ";
        cin >> moneyRequested;

        if (moneyRequested <= 0)
            cout << "Improper input, please try again." << endl;
        else
            break;
    }

    /* Checking what specific bills are needed for the user's change. */
    do
    {
        moneyRequested = user.check_for_next_bill(moneyRequested);
    }
    while( moneyRequested > 0.01);  // This going until it is greater than 0.01
     because if we use 0.00
                                    // then the check_for_next_bill program
                                     will continue to subtract
                                    // past 0.01 to 0.001, 0.0001, etc.

    /* Output of change given */
    cout << "Changed recieved: " << endl;
    user.output_of_change_given();

    return 0;
}
```

```
#ifndef coin_counter_h
#define coin_counter_h

#include <stdio.h>

/* constants -------------------- */

const float HUNDRED_DOLLAR_BILL = 100.00; // Dollars
const float FIFTY_DOLLAR_BILL = 50.00;
const float TWENTY_DOLLAR_BILL = 20.00;
const float TEN_DOLLAR_BILL = 10.00;
const float FIVE_DOLLAR_BILL = 5.00;
const float ONE_DOLLAR_BILL = 1.00;

const float QUARTER = 0.25; // Coins
const float DIME = 0.10;
const float NICKEL = 0.05;
const float PENNY = 0.01;

/* ------------------------------ */

/* "counter" struct used for tracking bills and coins needed. */
struct counter
{
private:
    int howMany100 = 0;
    int howMany50 = 0;
    int howMany20 = 0;
    int howMany10 = 0;
    int howMany5 = 0;
    int howMany1 = 0;
    int howManyQuarter = 0;
    int howManyDime = 0;
    int howManyNickel = 0;
    int howManyPenny = 0;
public:
    float check_for_next_bill(float remaining_amount);  // Adding more bills to
     the total change counters
    void output_of_change_given();  // Outputting the change needed onto the
     console

    /* Returning private variables */
    int hundreds_needed() { return howMany100; };
    int fifties_needed() { return howMany50; };
    int twenties_needed() { return howMany20; };
    int tens_needed() { return howMany10; };
    int fives_needed() { return howMany5; };
    int ones_needed() { return howMany1; };
    int quarters_needed() { return howManyQuarter; };
    int dimes_needed() { return howManyDime; };
    int nickels_needed() { return howManyNickel; };
```

```
    int pennies_needed() { return howManyPenny; };
};

#endif
```

```
#include<iostream>
#include<string>
#include"coin_counter.h"

using namespace std;

/* Adding more bills to the total change counters */
float counter::check_for_next_bill(float remaining_amount)
{
    /* If the total amount of change needed by the user exceeds more than a
     value of a certain
     bill or coin then then one of that bill or coin is recorded in the struct.
      That currency
     amount is also deducted from the total amount of change needed. */

    if (remaining_amount >= HUNDRED_DOLLAR_BILL)
    {
        remaining_amount = remaining_amount - HUNDRED_DOLLAR_BILL;
        ++howMany100;
    }
    else if(remaining_amount >= FIFTY_DOLLAR_BILL && remaining_amount <
     HUNDRED_DOLLAR_BILL )
    {
        remaining_amount = remaining_amount - FIFTY_DOLLAR_BILL;
        ++howMany100;
    }
    else if(remaining_amount >= TWENTY_DOLLAR_BILL && remaining_amount <
     FIFTY_DOLLAR_BILL)
    {
        remaining_amount = remaining_amount - TWENTY_DOLLAR_BILL;
        ++howMany20;
    }
    else if(remaining_amount >= TEN_DOLLAR_BILL && remaining_amount <
     TWENTY_DOLLAR_BILL)
    {
        remaining_amount = remaining_amount - TEN_DOLLAR_BILL;
        ++howMany10;
    }
    else if(remaining_amount >= FIVE_DOLLAR_BILL && remaining_amount <
     TEN_DOLLAR_BILL)
    {
        remaining_amount = remaining_amount - FIVE_DOLLAR_BILL;
        ++howMany5;
    }
    else if(remaining_amount >= ONE_DOLLAR_BILL && remaining_amount <
     FIVE_DOLLAR_BILL)
    {
        remaining_amount = remaining_amount - ONE_DOLLAR_BILL;
        ++howMany1;
    }
    else if(remaining_amount >= QUARTER && remaining_amount < ONE_DOLLAR_BILL)
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    {
        remaining_amount = remaining_amount - QUARTER;
        ++howManyQuarter;
    }
    else if (remaining_amount >= DIME && remaining_amount < QUARTER)
    {
        remaining_amount = remaining_amount - DIME;
        ++howManyDime;
    }
    else if(remaining_amount >= NICKEL && remaining_amount < DIME)
    {
        remaining_amount = remaining_amount - NICKEL;
        ++howManyNickel;
    }
    else if(remaining_amount >= PENNY && remaining_amount < NICKEL)
    {
        remaining_amount = remaining_amount - PENNY;
        ++howManyPenny;
    }

    /* Returning this float back to main to redo process. */
    return remaining_amount;
}

/* Outputting the change needed onto the console */
void counter::output_of_change_given()
{
    /* Basically this is outputting all bills and/or coins that
     will be a part of the user's change. However, if a certain
     bill or coin isn't needed, it will not show on the console,
     for example, as "0 $10 Bills." We just output what will be
     needed.

     We obtain the numbers from the return functions in the struct.

     There are two if statements: one for a singular cout statement
     and one for a plural cout statement. */

    if (hundreds_needed() == 1)
    {
        cout << hundreds_needed() << " $100 Bill" << endl;
    }
    else if (hundreds_needed() > 1)
    {
        cout << hundreds_needed() << " $100 Bills" << endl;
    }

    if (fifties_needed() == 1)
    {
        cout << fifties_needed() << " $50 Bill" << endl;
    }
```

```
else if (fifties_needed() > 1)
{
    cout << fifties_needed() << " $50 Bills" << endl;
}

if (twenties_needed() == 1)
{
    cout << twenties_needed() << " $20 Bill" << endl;
}
else if (twenties_needed() > 1)
{
    cout << twenties_needed() << " $20 Bills" << endl;
}

if (tens_needed() == 1)
{
    cout << tens_needed() << " $10 Bill" << endl;
}
else if (tens_needed() > 1)
{
    cout << tens_needed() << " $10 Bills" << endl;
}

if (fives_needed() == 1)
{
    cout << fives_needed() << " $5 Bill" << endl;
}
else if (fives_needed() > 1)
{
    cout << fives_needed() << " $5 Bills" << endl;
}

if (ones_needed() == 1)
{
    cout << ones_needed() << " $1 Bill" << endl;
}
else if (ones_needed() > 1)
{
    cout << ones_needed() << " $1 Bills" << endl;
}

if (quarters_needed() == 1)
{
    cout << quarters_needed() << " Quarter" << endl;
}
else if (quarters_needed() > 1)
{
    cout << quarters_needed() << " Quarters" << endl;
}

if (dimes_needed() == 1)
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    {
        cout << dimes_needed() << " Dime" << endl;
    }
    else if (dimes_needed() > 1)
    {
        cout << dimes_needed() << " Dimes" << endl;
    }

    if (nickels_needed() == 1)
    {
        cout << nickels_needed() << " Nickel" << endl;
    }
    else if (nickels_needed() > 1)
    {
        cout << nickels_needed() << " Nickels" << endl;
    }

    if (pennies_needed() == 1)
    {
        cout << pennies_needed() << " Penny" << endl;
    }
    else if (pennies_needed() > 1)
    {
        cout << pennies_needed() << " Pennies" << endl;
    }
}
```