Exercise: Change Loops

This exercise is designed to give you experience in using loops to repeat actions. You will have to ask the user for information and receive it. You will also need to display information for the user.

Making Change

You are running a lemonade stand. You need to make change for customers. You decide to write a program to help with the process. You already know the amount you need to give back to the customer, but you want the program to tell you how many quarters, dimes, nickels and pennies are needed to make the correct amount.

For example, your program might work like this:

```
How much change? 62
2 Quarters
1 Dimes
0 Nickels
2 Pennies
```

The program asked How much change?, the user typed 67, then the program gave the number of each coin type needed to make correct change.

The program should use as many quarters as possible, then as many dimes as possible, then as many nickels as possible. The remainder will be pennies.

Things You Should Know About User Input

You can ask the user for numbers and receive them using the input() command. For example, you can do this to ask for the width of a rectangle:

```
width = input("How wide is the rectangle? ")
```

This will cause the message in quotes to be displayed, and the program will pause until the user types a number and hits the enter key. After that, the number typed by the user will be stored in the width variable.

Of course, you’ll need to modify this statement to ask for the amount of change needed.

Things You Should Know About User Output

You can show messages to the user with the print command. For example, you can say hello to the user like this:

```
print "Hello"
```

This will display a line of output with the message in the quotes. If you want to display part of a message, but not complete the line, you can add a comma at the end of the statement, like this:

```
print "Hello",
```

This will display the message in the quotes, followed by a space, but the line will not be ended.

You can also display the value of a variable by naming the variable in the print statement. For example, the value of the width can be shown like this:

```
print width
```
Things You Should Know About Loops

Loops are used to repeat the same commands many times. The `while` loop repeats its commands until the logic it checks becomes untrue. Read this sample code:

```python
change = 17
nickels = 0
while change >= 5:
    nickels = nickels + 1
    change = change - 5
```

This loop will repeat as long as the value of the variable named `change` is at least 5. The commands that repeat add 1 to the count of how many nickels we want, and decrease the value of the `change` variable by 5.

Notice the `>=` symbols to mean greater than or equal to. We wouldn’t keep counting nickels if the change needed was less than 5 would we?

**Tasks:**

- Edit `change.py`.
- Make the program ask the user for the amount of change that needs to be made.
- Make the program tell the user how many pennies, if the change were only to be made with pennies.
- Make the program tell the user how many nickels and how many pennies, if the change were only to be made with nickels and pennies.
- Add dimes.
- Add quarters.
- Get your candy.

**Additional Tasks**

- Add the ability to make change for any amount less than $1,000. Use bills worth $100, $50, $20, $10, $5, and $1.
- Add the ability to ask the user the purchase total cost, and the amount of money given by the customer. Calculate the amount of change necessary, and the bills and coins required to make the change.

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