
Our Flounder

Computer Science Correspondence School

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Lecture 16

CISC 131
Introduction to Programming and Problem Solving
Spring 2020
Associated Array Practice

Due: **Wednesday, April 29, 2020, at start of class**
Points: **20**

Assignment

The last lecture introdueed locating the minimum and maximum values in an array as well as sorting arrays and the use of associated arrays. We will return to sorting and other array algorithms soon but today you will do an assignment that uses *associated arrays*. Locating the minimum, maximum, and sorting will not be part of this assignment.

Today you will write a program that asks the user to enter a money amount and then lists the currency and coins necessary to make change for that amount. For example, if the user entered *143.89*, the program would display:

```
1 Hundred dollar bill
2 Twenty dollar bill
3 One dollar bill
1 Half Dollar
1 Quarter
1 Dime
4 Penny
```

As you can see, the change that is made uses the fewest pieces of currency or coins and only includes the names of those that are needed. For example, the nickel was not needed, so it was not listed.

Name your program ***YourLastName*-MakingChange.js.** The user will enter the amount using a *window.prompt*. This will send the data entered by the user to your program in the form of a *String*. Your program must convert this *String* into an internally formatted number by using the *Number* function.

Place this *window.alert* statement inside a loop that will continue to ask the user to enter a money value until they enter a valid money value: one that is a non-negative number with no more than two places to the right of the decimal point. *Hint*: The *Number* function converts a *String* into a number. If that number is converted back into a *String*, it will have no trailing zeroes. If they enter an invalid amount, display an error message and end the program. If the amount is valid, end the loop, convert the value into its equivalent number of pennies and run the rest of the program.

Your implementation must use *associated arrays* – two arrays.in which the i_{th} element of each is related. An example of associated arrays is where you have an array of people's first names and an associated array of people's last names. The full name for a person is located in the i_{th} element of the two arrays as shown here:

i	first name
0	Chris
1	Liam
3	Paige

last name	*i*
Chan	0
McCullough	1
Turner	2

Using associated arrays greatly reduces the amount of programming statements that need to be written.

For this assignment, one of the associated arrays will contain the *String* description of the currency or coin (for example, *Ten dollar bill* or *quarter*) and the other associated array will contain the number of pennies repesented by the currency or coin (for example, 1000, 25). So there will be one *String* array associated with one numeric array.

Test your program thouroughly and verify the results. Once you are satisfied that it works correctly, refine the result so that it has the correct singular and plural form for the currency and coin units. That is, instead of indicating *3 Hundred dollar bill*, the function should report this as *3 Hundred dollar bills*. Note the *s* at the end of the word *bill*. *No changes should be made to the associated arrays in order to add this new feature.* For example, If the user entered 497.87, the function would return this:

```
4 Hundred dollar bills
1 Fifty dollar bill
2 Twenty dollar bills
1 Five dollar bill
2 One dollar bills
1 Half Dollar
1 Quarter
1 Dime
2 Pennies
```

The pennies value will need to be handled as a special case because its plural form differs from the other names.

What You Must Turn In

- Send me an email with this subject line:

  CISC131-MakingChange
- Attach the ***YourLastName*-MakingChange.js** to the email message and send it to me.
- Do NOT attach any other files.