

CSCI S-38 Summer 2018

Problem Set 6

Note:

You are being asked to create two classes. You will be graded on the quality of both your code and code to test the classes. You may not use any classes or functions from the STL. All possible members should be private and const.

Items marked with () are required (grad) / extra credit (undergrad)*

Part I:

Create a class called money with members as listed below. Create a test program to check every method.

- ☐ dollars, cents (should be private)
- ☐ default constructor
- ☐ constructor that takes amount of dollars and cents as input with cents defaulted to 0
- ☐ constructor that takes a double as a parameter and converts appropriately to dollars and cents
- ☐ copy constructor: initialize this Money object from another Money object
- ☐ destructor: the destructor should display "My wallet is now empty".
- ☐ "set" method to set the amount of dollars and cents using individual integer values
- ☐ "set" method to set the amount of dollars and cents using a double
- ☐ "increase" method to add to the amount of dollars and cents using individual integer values to represent the amount of dollars/cents to be added
- ☐ "decrease" method to add to the amount of dollars and cents using individual integer values to represent the amount of dollars/cents to be subtracted
- ☐ "show" to display the monetary value
- ☐ *operator += : to increase this Money object with the value of another Money object
myWallet += m;
- ☐ *operator += : to increase this Money object with a double
myWallet += dblAmount;
- ☐ *<< and >> operators to allow output/input respectively using cout/cin or a file
cin >> m;
cout << m;
- ☐ *comparison and equality operators (< > == !=)
if (m > myWallet) ...

Part II: Create a SafeArray class to hold a collection of integers, and a corresponding test program to check every method. The class will contain a dynamic data array of int's plus a data member called size which reflects the current size of the data array.

Implement the methods:

- ☐ Default constructor
- ☐ Copy constructor
- ☐ Constructor with initializer list – initializes the data array to the items in the list
- ☐ Destructor – frees memory
- ☐ addItem (int howMany, int value) - adds *howMany* slots to the data array. New items should be set to optional *value*. If *value* is not provided, set them to 0.
- ☐ removeItems (int howMany, int start) – removes *howMany* items from the start index – or from the end if no start index is specified
- ☐ at(int index) - return the value of the item at the specified index. Throw out of bounds exception if user attempts to exceed array boundaries
- ☐ put(int index, int data) - store *data* at the specified index. Throw out of bounds exception if user attempts to exceed array boundaries
- ☐ put (int index, int *data, int howMany) store *howMany* items pointed to by *data* starting at the specified index. Throw out of bounds exception if user attempts to exceed array boundaries
- ☐ copyTo(vector<int> v) Copy all data in the SafeArray to the vector
- ☐ size() - returns the number of elements (integers) in the data array
- ☐ clear() – empties the array