

BIT2400

Assignment A06

The Problem

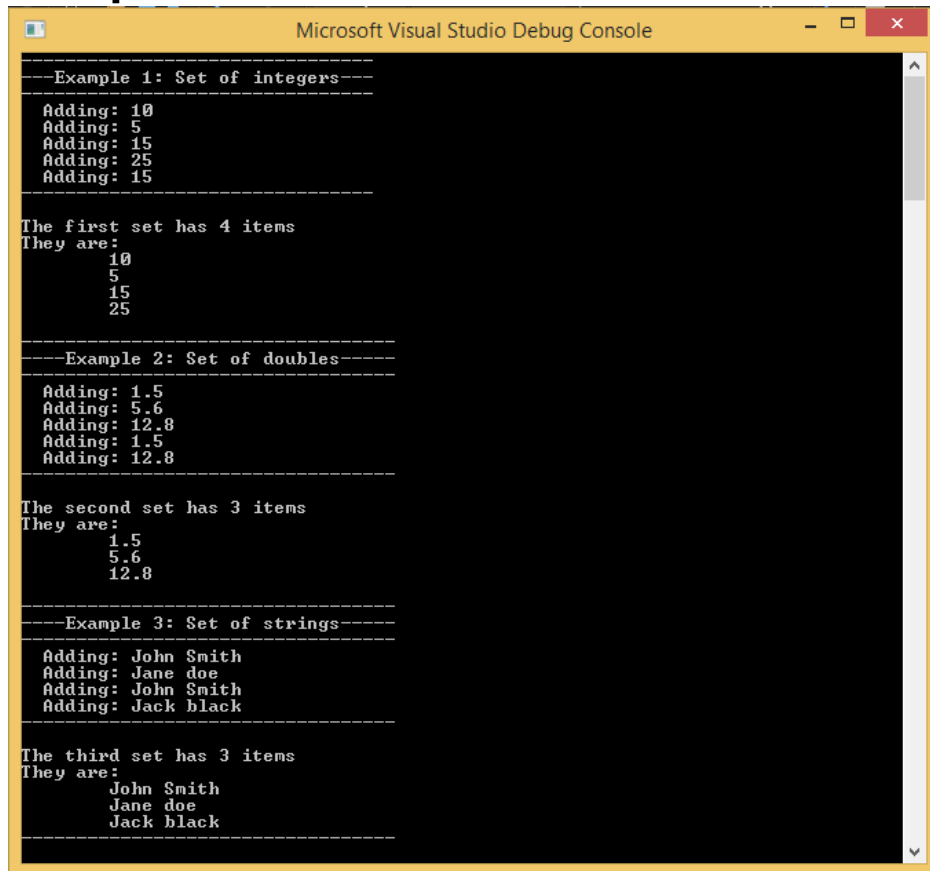
Write program that uses a class template to create a set of items. The program should:

1. add items to the set (there shouldn't be any duplicates)
 - **Example:** if your codes is adding three integers, 10, 5, 10, then your program will add only two values 10 and 5
 - **Hint:** Use vectors and vector functions to store the set of items
2. Get the number of items in the set
3. Get a pointer to a dynamic array that contains each item in the set
4. Make sure you de-allocate the memory when you are done
 - To dynamically allocate memory to a pointer, you can use the `new` operator.
Example:

```
Int *x, *y;  
// this will allocate only 1 integer  
x = new int;  
// this will allocate a double array of size 5  
y = new double [5];
```
 - When you are done using the pointer and you don't need it anymore, you have to free the memory to be able to reuse it for other pointers. To do so, you can use the `delete` operator
Example:

```
// this will free the memory allocated to a single element  
delete x;  
// this will free the memory allocated for an array of elements  
delete[] y;
```
5. In your main function, create a test scenario to test your class for a sets of different data types
 - a. Integers
 - b. Doubles
 - c. Strings
 - d. Any class of your choosing (Bonus 2 marks will be added towards your final course grade)
 - Hint: create a simple class and add objects of said class to your set

Sample Output:



```
Microsoft Visual Studio Debug Console

---Example 1: Set of integers---
Adding: 10
Adding: 5
Adding: 15
Adding: 25
Adding: 15

The first set has 4 items
They are:
    10
     5
    15
    25

---Example 2: Set of doubles---
Adding: 1.5
Adding: 5.6
Adding: 12.8
Adding: 1.5
Adding: 12.8

The second set has 3 items
They are:
    1.5
    5.6
   12.8

---Example 3: Set of strings---
Adding: John Smith
Adding: Jane doe
Adding: John Smith
Adding: Jack black

The third set has 3 items
They are:
    John Smith
    Jane doe
    Jack black
```

Other assignment Requirements:

1. You have to use classes and functions in your solution (encapsulation).
2. This assignment and all other assignments must be completed individually.
3. There might be similar ideas available online: **if you use any code that is available online you will receive a zero.**
4. You have to divide your solution into multiple files (main.cpp, Set.h).
5. The assignment **must** be solved in Visual Studio on Windows.
6. You have to submit your full project without the debug folder. **Submitting just the .cpp and .h files will result in receiving a zero.**