This is an individual assignment. Seeking direct help from students, tutors, and websites such as chegg or stack overflow will be construed as a violation of the honor code.

Semester Project Part 2: Templating the Stack

Data Structures and Analysis of Algorithms, akk5

Objectives

- To strengthen student's knowledge of C++ programming
- To give the student experience in writing Data Structures for data types
- To give the student experience writing a generalized class

Instructions

For this assignment you must write the template for a generalized stack class. This template should be based on the stack you implemented in Part 1; this means your stack class should be able to handle any type of data.

You should then write a program that tests your template. You create an instance of your template for the following data types: int, double, string and at least two classes of your own design and implementation. You should perform the following for each instance of the stack:

1. Push at least 3 elements of data onto the stack
2. Output the contents of the stack
3. Peek at the top of the stack
4. Output the results of the peek
5. Pop all but one element from the stack
6. Output the contents of the stack
7. Pop the last element from the stack
8. Output the results of the pop
9. Peek at the top of the stack

The custom classes you design and implement should contain at least two elements of member data and support the clerical methods necessary to set and get those values. Each class must also overload the << operator.

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Grading Breakdown

Point Breakdown	
Structure	12 pts
The program has a header comment with the required information.	3 pts
The overall readability of the program.	3 pts
Program uses separate files for main and class definitions	3 pts
Program includes meaningful comments	3 pts
Syntax	18 pts
Templates Class Node correctly	9 pts
Templates Class Stack correctly	9 pts
Behavior	70 pts
Program returns correct values for the following	
• Pushing at least 3 elements onto the stack	9pts
• Peeking at the top of the stack	9 pts
• Pop all but one element from the stack	9 pts
• Popping the last element from the stack	9 pts
• Peeking at an empty stack	9 pts
• Outputting the contents of a non-empty stack	9 pts
• Outputting the contents of an empty stack	9 pts
• Creating proper instances of the stack for int, double, string, plus two custom classes	7 pts
Total Possible Points	**100pts**
Penalties	
Program does NOT compile	-100
Late up to 24 hrs	-30
Late more than 24hrs	-100

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Header Comment

At the top of each program, type in the following comment:

/*

Student Name: <student name>

Student NetID: <student NetID>

Compiler Used: <Visual Studio, GCC, etc.>

Program Description:

<Write a short description of the program.>

*/

Example:

/*

Student Name: John Smith

Student NetID: jjjs123

Compiler Used: Eclipse using MinGW

Program Description:

This program prints lots and lots of strings!!

*/

Assignment Information

Due Date: 9/23/2018 (Section 1), 9/22/2018 (Section 3)

Files Expected:

1. Main.cpp – File containing function main
2. Stack.h - File containing the templates for the Stack and Node class.