

COMP10120 Practical Set 10: C++ Classes and Objects

Please read the questions carefully. Name each program based on your student number, the practical set number and question number. For this set (set10), question 1 should be named 1234567s10q1.cpp where your student number replaces 1234567. All questions that you are submitting can be zipped into a single file called 1234567s10.zip, where 1234567 is your student number and s10 refers to set 10. Please also include a readme.txt file which says which compiler you used to test your implementation. This zipped file must be submitted via Moodle for grading.

To compile a C++ Program from the command line, the process is exactly the same as for C files. Remember to save your program with the .cpp extension. Instead of using gcc, use g++. For example to compile a program called prog.cpp, use the following: `g++ C:\Comp10120\Practical10\prog.cpp`.

1. In C++, demonstrate function overloading by creating 4 functions called addTwo in the one program which have two arguments of the same type (floats, integers, doubles and longs) and return the two numbers added together.
2. In C++, create another example program which demonstrates function overloading. Be sure to provide output to the screen which describes what the program does.
3. In C++, write a program to find the area of different shapes. The user should be able to specify the required parameters, however, the following default parameters for each area function should also be provide.
 - a. Triangle: height = 1.0 and base = 2.3;
 - b. Square: side = 10;
 - c. Rectangle: length = 20;
 - d. Rhombus: diagonal 1 =10.2, diagonal 2 = 3.8;
 - e. Circle: radius = 3.6;
 - f. Trapezoid: base = 8;
4. In C++, create a Student Class which a university uses to represent the students in a university management system. The Student Class should have appropriate data members to uniquely identify a student, provide their name, address, phone number, field of study, stage (year 1, year 2, etc.) and current GPA. The Student Class should also have appropriate *mutator* and *accessor* member functions. Member functions to increase a student's stage should be provided. Additionally member functions to decrease and decrease the student's GPA are required. Finally a warning should be issued if the GPA of a student falls below 2.

Instantiate 2 Student Objects to demonstrate the operation of the Student Class.

See lecture Notes 17.