CS 2028 C 001

LAB 4 Report

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Overview

The purpose of Lab 4 is to learn how class inheritance and polymorphism work in C++. The main task is to create a streaming service simulation that has both TV shows and movies. TV shows and movies inherit their members from a class called Show, where the title and description are defined. In addition, a virtual function is used to ensure it is overwritten by the derived class, even if the derived class is declared as the base class.

Task 1

The base class, referred to as "Show," is created in this step. Its purpose is to be a base for the inheriting classes defined later. Using the basics of creating a class in C++, the class can be created in a header and a separate cpp file. In this program, show has 2 member variables and 6 member functions. Two member functions include a default constructor and an overload that allows you to pass in a title and description for the show. These functions will always be available and will always be called in the constructing of any derived classes. There are also 2 getter functions that will always be available to any derived class declared with Show in public mode. The main features of note here are the play_() function and the details_() function.

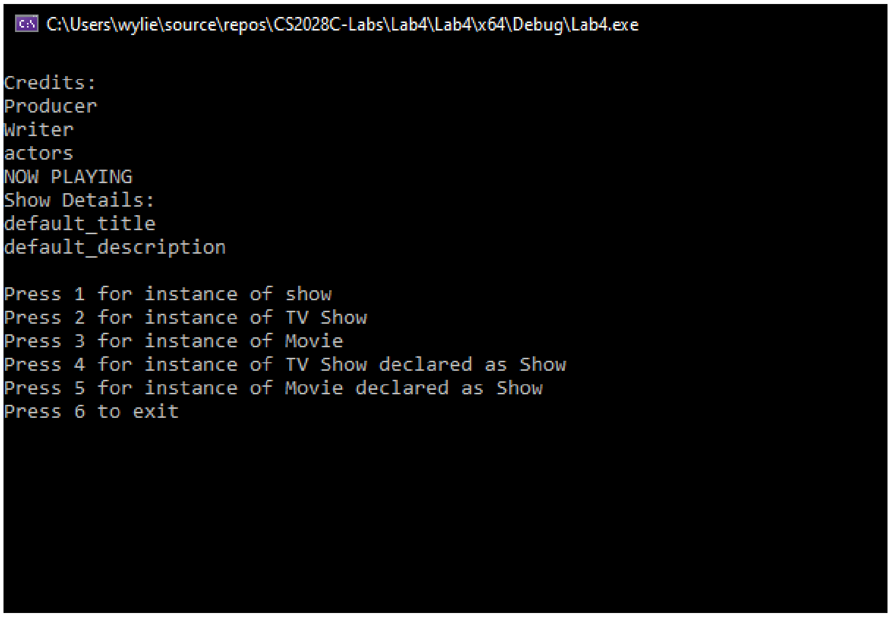
Play is a virtual function, meaning that any redefinition of play will overwrite it. It can still be defined and used, however it will always be overwritten if the overload is the same. The other function here, details_() is always available if not overwritten. If details_() is redefined, it can be called with "this->Show::details_();."

Task 2

Task 2 had me creating classes, "TV" and "Movie," derived from Show. These classes overrode the function, "play_()" with a version specific to a movie or a TV series. The TV needed to also override the "details_()" function in order to display the seasons and episodes. In this case, the original details function from Show can be called if you call details with respect to the base class (Show::details_()). The "play_()" method is declared as a virtual function in Show and overridden TV and Movie, so it becomes the redefinition regardless. The getters from Show are available to the derived class at any time.

The principles of polymorphism and inheritance are important to software development so that you can define something once and have it passed to any number of derived objects.

Task 3



C:\Users\wylie\source\repos\CS2028C-Labs\Lab4\Lab4\x64\Debug\Lab4.exe

```
Credits:
Producer
Writer
actors
NOW PLAYING
Show Details:
default_title
default_description

Press 1 for instance of show
Press 2 for instance of TV Show
Press 3 for instance of Movie
Press 4 for instance of TV Show declared as Show
Press 5 for instance of Movie declared as Show
Press 6 to exit
```

Figure 1: 3 was entered for an instance of movie

The test results are successful. The opening credits are played first thing, followed by the details of the show object.

Final thoughts

Being able to define one class and have others inherit its members is an important ability in making code elegant and faster to create. Polymorphism allows the programmer to make one member function have multiple different uses and applications for each different scenario.