**Logo

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**CS360L - Programming in C and C++ Lab**

**Lab Assignment #7**

**Due day: 07/12/2022**

**Instruction:**

1. **Push the answer sheets/source code to Github**
2. **Please follow the code style rule like programs on handout.**
3. **Overdue lab assignment submission can’t be accepted.**

**4. Take academic honesty and integrity seriously (Zero Tolerance of Cheating & Plagiarism)**

1. State whether each of the following is *true* or *false*. If *false*, explain why.
   1. Base-class constructors are not inherited by derived classes.
   2. A *has-a* relationship is implemented via inheritance.

[Note: the *has-a* relationship represents composition]

* 1. A *Car* class has an *is-a* relationship with the *SteeringWheel* and *Brakes* classes.

[Note: The *is-a* relationship represents inheritance]

* 1. Inheritance encourages the reuse of proven high-quality software.
  2. When a derived-class object is destroyed, the destructors are called in the reverse order of the constructors.

1. Some programmers prefer not to use *protected* access because they believe it breaks the encapsulation of the base class. Discuss the relative merits of using *protected* access vs. using *private* access in base classes.
2. Imagine a publishing company that markets both book and audiocassette versions of its works. Create a class *publication* that stores the title (a *string*) and price (type *float*) of a publication. From this class derive two classes: *book*, which adds a page count (type *int*), and *tape*, which adds a playing time in minutes (type *float*). Each of these three classes should have a *getdata()* function to get its data from the user at the keyboard, and a *putdata()* function to display its data.

Write a *main()* program to test the *book* and *tape* classes by creating instances of them, asking the user to fill in data with *getdata()*, and then displaying the data with *putdata().*

1. Start with the *publication*, *book*, and *tape* classes of question 3. Add a base class *sales* that holds an array of three *floats* so that it can record the dollar sales of a particular publication for the last three months. Include a *getdata()* function to get three sales amounts from the user, and a *putdata()* function to display the sales figures. Alter the *book* and *tape* classes so they are derived from both *publication* and *sales*. An object of class *book* or *tape* should input and output sales data along with its other data. Write a *main()* function to create a *book* object and a *tape* object and exercise their input/output capabilities.
2. Assuming that the publisher in question 3 and 4 decides to add a third way to distribute books: on computer disk, for those who like to do their reading on their laptop, add a *disk* class that, like *book* and *tape*, is derived from *publication*. The disk *class* should incorporate the same member functions as the other classes. The data item unique to this class is the disk type: either CD or DVD. You can use an *enum* type to store this item.

The user could select the appropriate type by typing *c* or *d*.

Write a *main()* function to verify your program