EE208 Laboratory Session 9

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1 Lab objectives

In this lab you will start to work with classes in C++ that use some of the inheritance techniques discussed in lectures 11-12. You will also be required to design your solutions using object oriented design techniques and class diagrams (see last lecture). This lab will not be graded but you are recommended to submit a solution regardless, as the next lab will be based on this proble, and the final lab exam (worth 20

Learning Outcomes
Having completed this lab you will be able to create inheritance hierachies in C++. You should understand the details of object construction and destruction within such hierarchies. You should also know how to create and manage C++ project with MSVisual Studio. A core objective of this lab is that you design your solutions for the first time using OOD and UML techniques. *This means I wont be telling you exactly what to do anymore; you will be expected to figure out your own solution from a basic set of requirements.*

2 Questions:

For each of the problems given below write a C++ program that provides a solution. Although you will not be graded on this work, you are encouraged to submit your solutions to moodle.

Remember:

- **Comment your code.**
- **Use proper indentation for function and control structures.**
- **Make sure you take the time to create a complete class diagram for your solution. It is highly recommended that you read both exercises before creating a class diagram.**
- **You can continue to use the command line compiler if you wish. However, this makes life a little difficult for debugging your code. I would encourage you to begin using Microsoft Visual Studio Express, which is available on your lab PCs.**

Exercise 1: You have been hired by Easons bookshop to develop a software system to manage their warehouse of books. Your software will be used by the warehouse manager to monitor the books in the warehouse. Two publications types are of interest: books and magazines. Books can be broken down into two types: hardback and softback. Various book details should be included, such as author, title, edition, publisher, and number of copies in stock in the warehouse. Each individual book has its own barcode number. Various magazine details should be included, such as title, publisher, current monthly edition (eg, Feb, March, April etc.), ISBN number, and number of copies in stock in the warehouse. Note that each individual book and magazine should have a unique barcode number. Functionality should exist such that you should be able to add to or subtract from the number of copies in stock for all publication types on request. Functionality should also exist to print out all info relating to a given publication. Your solution must use inheritance and contain appropriate constructors and destructors for the various classes.

Demonstrate your classes in action in a main function by creating a number of books/magazines and then printing their details to screen. **You should create a class diagram in doc format; this should be completed before starting to write any code.** All code should be in appropriate cpp and h files specific to each class.

Exercise 2: Easons like what youve done so far. They want to extend your code so that the warehouse manager and three bookshops (Maynooth, Dublin and the fine town of Mullingar) can keep track of what publications are available and where. All four (the warehouse and the three bookshops) should each have their own database of publications containing a complete list of publications available in the warehouse or bookshop at any given time. Functionality should exist such that copies of existing publications can be added to or removed from a database if sold or returned. Functionality should exist to enable transferring of copies from the warehouse to a bookshop. Functionality should exist such that all four can print out details of any given book in any place (the warehouse and the three bookshops).

Demonstrate your classes in action in a main function as you see fit. **You should create a class diagram in doc format; this should be completed before starting to write any code.** All code should be in appropriate cpp and h files specific to each class.*Please note identical code from multiple students will be graded with 0 marks.*