

SCSSE, University of Wollongong

CSCI204/MCS9204 Object and Generic Programming in C++ Laboratory Exercise Week 8

Task One: Debugging

Virtual.cpp and **Throw.cpp** contain various errors; syntax, logical and/or with respect to the sample output.

Fix the bugs so the programs can be compiled and run correctly producing the following output

A x: 4

A x: 6

B y: 5

SixSevenThreeFour

Five

Task Two: A leaky program

The program **Leaky.cpp** has memory leaks. Find them and fix them. Remember you can use **bcheck** to check for memory leaks.

Task Three: Exceptions

Write code in a file **Book.cpp** that contains a **Book** class with fields for a book identification number, title, authors, number of pages and price. The **book title** and **author** should be stored as **character pointers**, and the constructor **should allocate 80 characters** of new memory for each. You should include appropriate **insertion** and **extraction operators** for the **Book**. Remember to define destructor for the class **Book**.

Create a **BookException** class **inherits runtime_error** in the file **Book.cpp** that holds a **Book** and an error message. When a **Book** is being created, two exceptions are to be looked for based on the following rules:

1. The number of pages should be divisible by four.
2. The price should be between \$5.00 and \$250.00 inclusive.

If one of these conditions is not met, you should create and throw an appropriate **BookException** object. **Override what()** function in the class **BookException** to return exception message.

Write a **main()** function in the file **Book.cpp** which creates an array of two **Book** objects. If a **BookException** object is thrown during the data entry of a **Book**, the user should be required to enter data for a new **Book** to replace the invalid **Book**. Thus you keep on entering **Book** details until you have two valid books. Then display those two books.

Testing task Three:

Compile your program by

CC -o task3 Book.cpp

Your program outputs may look like following (Red data means inputs from keyboard).

Id number: 1

Title: How to program C++

Authors: Paul Deitel, Harvey Deitel

Number of pages: 1027

The no. 1 book error.

Id number: 1

Title: How to program C++

Authors: Paul Deitel, Harvey Deitel

Number of pages: 1027

Price: 0.00

Incorrect number of pages.

Id number: 1

Title: How to program C++

Authors: Paul Deitel, Harvey Deitel

Number of pages: 1028

Price: 1128.3

The no. 1 book error.

Id number: 1

Title: How to program C++

Authors: Paul Deitel, Harvey Deitel

Number of pages: 1028

Price: 1128.30

Incorrect price.

Id number: 1

Title: How to program C++

Authors: Paul Deitel, Harvey Deitel

Number of pages: 1028

Price: 112.83

Id number: 2

Title: A structure programming approach using C++

Authors: Behrouz A. Forouzan, Richard F. Gilberg

Number of pages: 882

The no. 2 book error.

Id number: 2

Title: A structure programming approach using C++

Authors: Behrouz A. Forouzan, Richard F. Gilberg

Number of pages: 882

Price: 0.00

Incorrect number of pages.

Id number: 2

Title: A structure programming approach using C++

Authors: Behrouz A. Forouzan, Richard F. Gilberg

Number of pages: 884

Price: 1.235

The no. 2 book error.

Id number: 2

Title: A structure programming approach using C++

Authors: Behrouz A. Forouzan, Richard F. Gilberg

Number of pages: 884

Price: 1.24

Incorrect price.

Id number: 2

Title: A structure programming approach using C++

Authors: Behrouz A. Forouzan, Richard F. Gilberg

Number of pages: 884

Price: 123.5

Two books are:

Id number: 1

Title: How to program C++

Authors: Paul Deitel, Harvey Deitel

Number of pages: 1028

Price: 112.83

Id number: 2

Title: A structure programming approach using C++

Authors: Behrouz A. Forouzan, Richard F. Gilberg

Number of pages: 884

Price: 123.50

You can use the input data file **input_books.txt** to test your program:

```
task3 < input_books.txt
```