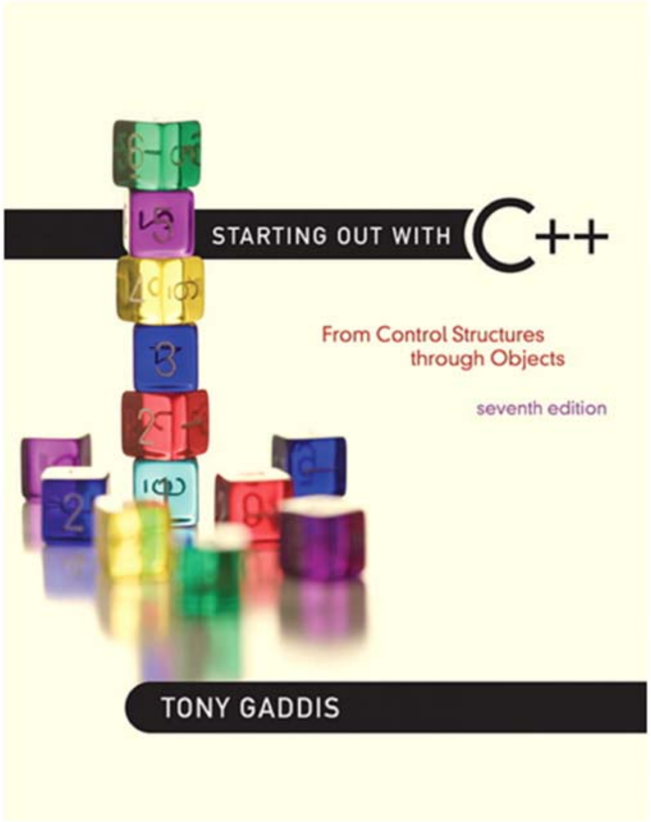
LAB MANUAL

to Accompany



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Lab Manual Introduction

To the Student...

A closed laboratory in computer programming is a vital activity for helping you gain valuable programming skills. Programming cannot be learned by “spectators”. In other words, you cannot become a skilled programmer simply by watching others do it. You must spend numerous hours working on programs yourself. A closed laboratory experience gives you the opportunity to edit, write, compile, build, and execute programs of varying length and complexity under the guidance of your instructor. You will be able to reinforce concepts learned in class with a “hands on” approach. Throughout the course, your programming skills should steadily progress by applying knowledge learned in class to the laboratory setting.

This lab manual is divided into chapters called “Lesson Sets”. At the beginning of each lesson set you will see a Purpose section which outlines the goals and expected outcomes of the lesson. This is immediately followed by a Procedure section. The first two steps of this section ask you to complete the Pre-lab Reading and Pre-lab Writing Assignments as a prerequisite to attempting the labs. It is imperative that you do both assignments before coming to your lab session. The laboratory exercises assume you have read and understood the key points of the corresponding lesson. The Pre-lab Writing Assignment usually consists of 8 – 10 very simple fill in the blank questions. Once the Pre-lab Reading is complete, you should have no trouble completing these questions. Your instructor may choose to collect this assignment at the beginning of your lab session. Although each Pre-lab Reading Assignment gives a concise overview of key concepts from the corresponding chapter in the text, it is not a substitute for reading your text. The text develops ideas in much more detail and also covers certain topics that cannot be included in a closed lab due to time constraints. Hence, this lab manual should be used as a supplement, not a replacement, for the text.

Your instructor will tell you which lab assignments should be completed during the lab session and which should be completed outside of class for homework. Although a hard copy of all code used for the lab assignments is included at the end of each lesson set, the code is also included in electronic form on the Web at www.aw.com/cssupport, under author “Gaddis.” You should use this code rather than re-typing it from scratch.

To the Instructor...

A closed laboratory in computer programming is a vital activity for helping students gain valuable programming skills under your guidance. Many different opinions concerning the content of such labs have been generated over the past few years, ranging from programming assignments to scheduled exercises using prepared materials. Although this manual emphasizes the latter approach and has pre-developed code for students to complete or edit, there are assignments that ask each student to independently create small programs which may be assigned as lab activities or as post-lab homework. These student generated code assignments are not intended as a substitute for larger programming assignments. Rather, they are small programs designed to test students on the material given in the lessons. The length of the lab activities vary from fifty minutes to two hours, depending on the particular institution. For this reason, the manual is divided into "Lesson Sets", each consisting of two fifty to sixty minute lessons of lab work. A fifty minute lab session should be able to complete an individual lesson and a one and a half to two hour session should be enough time for an entire lesson set. These times refer to "average classes". It is of course impossible to set a time frame for each student in a given lab. It is natural that some advanced students may finish a little early, while others will need more than the suggested time frame. Each Lesson Set corresponds to a chapter from Starting Out with C++: From Control Structures through Objects, Sixth Edition, by Tony Gaddis. The one exception, however, is Chapter 6. This chapter deals with functions and the corresponding laboratory exercises are broken into two lesson sets.

The lab exercises in each lesson set are generally very simple to start and then increase in difficulty. Consequently, the student generated code assignments, which ask students to write complete programs, are given at the end of the second lesson. Most lesson sets contain three such assignments, so you have some flexibility as to how many of these programs are written during the laboratory session. A few lessons do have one somewhat sophisticated (to a beginning programmer) student generated code assignment. Other programming assignments may also be found at the end of each chapter of the text.

Each lesson set consists of the following:

Pre-lab Reading Assignment. This will prepare the students for material presented in the lab. This section gives a good, but brief, review of the corresponding chapter of the text. Examples and sample code are provided throughout this section, some of which are used in the subsequent labs. Students should thus be required to read this section before coming to lab.

Pre-lab Writing Assignment. These consist of short and easy questions on the reading material so that you may make sure students completed the pre-lab reading.

Two Lessons of Lab Assignments. These are done during the lab time, one lesson per hour (or fifty minute period).

Supplements: The following items are available at Addison-Wesley's Instructor Resource Center. Visit the Instructor Resource Center at www.aw.com/irc to register for access.

- Solutions to the lab exercises
- Teacher's Notes which consist of the following:

Objectives for Students. These are similar to the Purpose section given at the beginning of each lesson set in the lab manual. However, the objectives listed are geared more for the lab work whereas the Purpose section in the manual refers to the Pre-lab Reading material as well. In some lessons they are the same.

Assumptions. This section gives a brief list of what students should already know before attempting the corresponding lab assignment. It is generally assumed that the students have completed and understood the previous lessons (although some of the later lessons can be skipped) and that they have read and understood the Pre-lab Reading Assignment for the current lesson.

Pre-lab Writing Assignment Solutions. This section contains the answers to the Pre-lab Writing Assignment.

Lab Assignments. This section first lists the labs and then gives a more detailed description of each lab. Labs are broken into the lessons in which they are assigned.

Each instructor is encouraged to pick and choose labs based on the needs of their individual classes. The following is a suggested outline for a 14 week course that meets in a closed lab once a week for 50-60 minutes. This allows you to still cover one chapter a week for most weeks. As a general rule, a one hour lab session is enough time to complete section A of each lesson set. Assignments from section B, including the student generated code assignments, could be given as homework assignments.

Week 1	Lesson Set 1	Lab 1.1	Lab 1.2	Lab 1.3	Lab 1.4 (Optional Homework)
Week 2	Lesson Set 2	Lab 2.1	Lab 2.2		Lab 2.4 (Optional Homework)
Week 3	Lesson Set 3	Lab 3.1	Lab 3.2	Lab 3.3	Lab 3.4 (Optional Homework)
Week 4	Lesson Set 4	Lab 4.1	Lab 4.2	Lab 4.3	Lab 4.4 (Optional Homework)
Week 5	Lesson Set 5	Lab 5.1	Lab 5.2		Lab 5.5 (Optional Homework)
Week 6	Lesson Set 6.1	Lab 6.1	Lab 6.2		Lab 6.3 (Optional Homework)
Week 7	Lesson Set 6.2	Lab 6.5	Lab 6.6		Lab 6.7 (Optional Homework)
Week 8	Lesson Set 7	Lab 7.1	Lab 7.2		Lab 7.3 (Optional Homework)
Week 9	Lesson Set 8	Lab 8.1	Lab 8.2		Lab 8.3 (Optional Homework)
Week 10	Lesson Set 9	Lab 9.1	Lab 9.2		Lab 9.3 (Optional Homework)
Week 11	Lesson Set 10	Lab 10.1	Lab 10.2	Lab 10.3	Lab 10.4 (Optional Homework)
Week 12	Lesson Set 11	Lab 11.1	Lab 11.2	Lab 11.3	Lab 11.4 (Optional Homework)
Week 13	Lesson Set 12	Lab 12.2	Lab 12.3		Lab 12.4 (Optional Homework)
Week 14	Lesson Set 13	Lab 13.1	Lab 13.3	Lab 13.4	Lab 13.2 (Optional Homework)

For a one semester course that meets 2 hours a week in a closed lab, one lesson set per week will cover the manual in a fourteen week semester.