UNIT 06: IO STREAMS AND DATA FILES IN C++

Lesson 1

- I/O File Stream Objects and Methods
- Reading and Writing Text Files
- File Streams as Function Arguments

References

Bronson, G. (2012). Chapter 9 I/O Streams and Data Files. In *A First Book of C++* (4th ed.). Boston, MA: Course Technology.

Orientation

This Week

- Lesson 1 (Today):
  - Establish groups for lab assignment
  - In-class guided instruction activities.
- Lesson 2:
  - More in-class guided instruction activities.
  - Introduce unit supplemental topics.

Next Week

- Lesson 3
  - Finish activities, if needed.
  - Time to work on the lab assignment
- Lesson 4
  - More time to work on the lab assignment, if needed.
  - Orientation to next unit.

Upcoming Evaluation

- Lessons 1, 2, 3, 4 in-class marks.
  - Pass/Fail: need to be in class.
- Monday, 31 Mar
  - Group Lab 6 (8:00AM)
  - Quiz 6 (Noon)
- Tuesday, 1 Apr
  - Video Lab 7A: Classes (8:00AM)

Group Lab 6 Requirements

- **Due Monday, Mar 31 at 8:00 AM**
- To access the drop-box for Group Lab 6, you need to be in a group (2 or 3 students) in DC Connect.
  - Communication -> Groups
  - Categories: Lab 6 Groups

Lab 6

- Only one submission is required for the group.

In-Class Activity Requirements

- Each of the activities will involve writing programs. You will collaborate in groups of 2 to 3 students, but each of you will write your own programs on your own laptop.
- You will be submitting your source code at the end of the lesson for marks.
- You must be present, in class, to be eligible to participate in the activities, and thus be eligible for these marks.

File Stream Objects

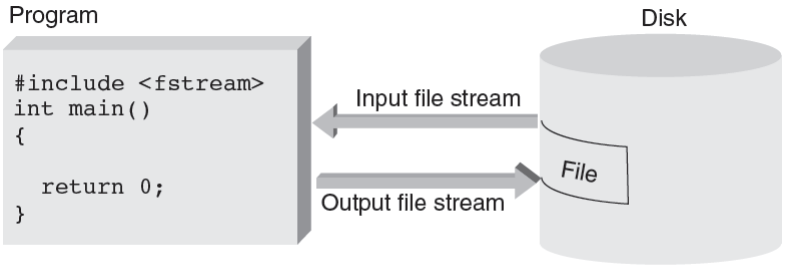

Figure 9.1 Input and output file streams

Table 9.2 File Status Methods

Prototype	Description
`fail()`	Returns a Boolean `true` if the file hasn't been opened successfully; otherwise, returns a Boolean `false` value.
`eof()`	Returns a Boolean `true` if a read has been attempted past the end of file; otherwise, returns a Boolean `false`. The value becomes `true` only when the first character after the last valid file character is read.
`good()`	Returns a Boolean `true` while the file is available for program use. Returns a Boolean `false` if a read has been attempted past the end of file. The value becomes `false` only when the first character after the last valid file character is read.
`bad()`	Returns a Boolean `true` if a read has been attempted past the end of file; otherwise, returns a `false`. The value becomes `true` only when the first character after the last valid file character is read.

Activity 1

- Guided Activity:
  - We will complete a simple program that will attempt to open a text file for reading (input), and check to see if the attempt was successful.
  - Open the starter file *CPRG06-01.cpp*
  - Add the code for the following:
    - Attempt to open the file named "prices.dat"
    - Check for an unsuccessful open
    - Close the file

CPRG06-01.cpp

Activity 1

- A _____ is any collection of data stored in an external storage medium under a common name.
- A C++ program can connect and read from a data file through a _____ *object*.
- The _____ *method* is used to connect the internal object name with the external data file name.
- The four *methods* commonly used to check the status of a file are: _____.

Activity 2

- Guided Activity:
  - We will complete a program that will attempt to open a text file for writing (output), prompting the user for an overwrite decision.
  - Open the starter file *CPRG06-02.cpp*
  - Add the code for the following:
    - Open the file in input mode to see if it exists
    - Open the file in output mode, creating a new file
    - Open the file in append mode, put the position marker at the end
    - Checking for a successful file opens.
    - Closing the files

CPRG06-02.cpp

Activity 2

- A C++ program can connect and write to a data file through a _____ *object*.
- If a file exists, what will occur when it is opened in:
  - input mode (ios::in)?
  - output mode (ios::out)?
  - append mode (ios::app)?
- If a file does not exist, what will occur when it is opened in:
  - input mode (ios::in)?
  - output mode (ios::out)?
  - append mode (ios::app)?

Activity 3

CPRG06-03.cpp

- Guided Activity:
  - We will complete a program that will attempt to open a text file for writing (output), prompting the user for an overwrite decision, all in a function.
  - Open the starter file *CPRG06-03.cpp*
  - Add the code for the following:
    - Code the function prototype and header.
    - Call the function as part of an if statement condition.
    - Write "Hello, World" to the file.

Activity 3

- *True or False*: Opening a file, performing read/write actions, and closing a file may each occur in **different functions**.
- A file stream object **may be passed to a function** as an argument, but must always be passed by _____.
- Writing text to a file is very similar to writing text to the _____ using _____.

Submission

- Open the *Unit 6- Lesson 1 Activities* Dropbox
- Attach your source code files *individually* (**DO NOT ZIP**) and submit
  - *CPRG06-01.cpp,*
  - *CPRG06-02.cpp, and*
  - *CPRG06-03.cpp.*