Introduction to C++ (Season 2)

Unit 7: File Input and Output

第7单元:出入虽同趣，所向各有宜— 文件输入输出

Section 05 : File Open Mode & Testing File State

第05节： 文件的打开模式与测试文件状态

fstream and File Open Modes (fstream与文件打开模式)

- ofstream : write data; ifstream : read data
- fstream = ofstream + ifstream
  - When : uses the same stream object for both input & output. (用一个流对象输入输出)
  - How : To open an fstream file, specify a file mode (创建fstream对象，指定文件模式)
- The file modes (文件的访问模式)

Mode	Description
ios::in	Opens a file for input. 读模式
ios::out	Opens a file for output. 写模式
ios::app	Appends all output to the end of the file. 追加模式
ios::ate	Opens a file for output. If the file already exists, move to the end of the file. Data can be written anywhere in the file. 打开文件用于输出。若文件存在则光标移至文件尾部。数据可以在任意位置写入
ios::truct	Discards the file's contents if the file already exists. (This is the default action for ios:out). 若文件存在则丢弃其内容，这是 ios:out 的默认方式
ios::binary	Opens a file for binary input and output.打开文件以二进制模式读写

Combining Modes (模式组合)

- Combine several modes (几种模式可以组合在一起)
  - using the | operator (bitwise inclusive OR) (用“位或”运算符)
- To open an output file "city.txt" for appending data:

```
stream.open("city.txt", ios::out | ios::app);
```

→ AppendFile

Testing Stream States (测试流状态)

- Method 1: eof() and fail()
- Method 2: state flags of stream object (用流对象的状态标志位)

- Stream State Bit (流状态位)
  - These bit values (0 or 1) indicate the state of a stream. (比特值指示流的当前状态)

Bit	When to set
ios::eofbit	Set when the end of an input stream is reached. 到达文件末尾时
ios::failbit	Set when an operation failed. 操作失败时
ios::hardfail	Set when an unrecoverable error occurred. 遇到不可恢复的错误时
ios::badbit	Set when an invalid operation has been attempted. 试图进行非法操作时
ios::goodbit	Set when an operation is successful. 操作成功时

Stream State Functions(流状态函数)

Function	Description
eof()	Returns true if the **eofbit** flag is set.
fail()	Returns true if the **failbit** or **hardfail** flags is set.
bad()	Returns true if the **badbit** is set.
good()	Returns true if the **goodbit** is set.
clear()	Clears all flags.

→ShowStreamState