File Streams Solutions

Stream Types

- Explain the similarities and differences between iostream and fstream
  - iostream is used for input from and output to the system console
  - The C++ standard library provides unique objects for this (cin and cout)
  - fstream is used for reading from and writing to files
  - There are many possible file streams, so we have to create the objects ourselves

How to Open a File for Reading

- Describe how to open a file for reading (i.e., receiving input from the file)
  - We can pass the file's name as argument to the fstream constructor
- How can we tell whether the file was successfully opened?
  - Use the fstream object as a conditional
  - It will return true if the file was successfully opened, false if it was not

Reading from a File

- Write a program which
  - Opens a file
  - Reads its contents using the >> operator
  - Prints out each word as it is read
- The file should be in the same directory that the program runs in
  - For an IDE, this can usually be done by creating a new file in the project
- Are there any disadvantages to reading it this way?
  - All whitespace in the input is discarded (this may not be what is required)
  - If the file has an internal structure, the code can be difficult to get right
  - Difficult to handle errors if the file structure does not exactly match the program's expectations

Reading from a File Contd

- Write a program which
  - Opens a file
  - Reads its contents using the getline() function
  - Prints out each line as it is read
- Are there any advantages to reading it this way?
  - All whitespace in the input is retained (except for the newline character)
  - The line of output is stored in an std::string variable
  - The program can validate the data in this variable and process it as required

How to Open a File for Writing

- Write a program which opens a file and writes some text to it
- Verify that the output file has been created and contains the correct text.
  - The file will usually be in the same directory that the program runs in
  - If you are using an IDE, you may need to check the project settings to find where this is

fstream destructor

- What happens when fstream's destructor is called?
  - When fstream's destructor is called, the file is automatically closed
  - This will cause any unsaved data to be written to the file
  - If an fstream object goes out of scope after we have finished with it, we do not need to explicitly call close()
  - However, it is good practice to do so