File Input Streams

Creating an Input Stream Object

In C++, you can use the `std::ifstream` object to handle input file streams. To do this, you will need to include the header file that provides the file streaming classes: `<fstream>`.

Once the `<fstream>` header is included, a new input stream object can be declared and initialized using a file path `path`:

```
std::ifstream my_file;
my_file.open(path);
```

Alternatively, the declaration and initialization can be done in a single line as follows:

```
std::ifstream my_file(path);
```

C++ `ifstream` objects can also be used as a boolean to check if the stream has been created successfully. If the stream were to initialize successfully, then the `ifstream` object would evaluate to `true`. If there were to be an error opening the file or some other error creating the stream, then the `ifstream` object would evaluate to `false`.

The following cell creates an input stream from the file `"files/1.board"`:

In [ ]:

```
#include <fstream>
#include <iostream>
#include <string>

int main()
{
    std::ifstream my_file;
    my_file.open("files/1.board");
    if (my_file) {
      std::cout << "The file stream has been created!" << "\n";
    }
}
```

Compile & Execute | Explain

Loading terminal (id_7qs09au), please wait...

Reading Data from the Stream

If the input file stream object has been successfully created, the lines of the input stream can be read using the `getline` method. In the cell below, a while loop has been added to the previous example to get each line from the stream and print it to the console.

In [ ]:

```
#include <fstream>
#include <iostream>
#include <string>

int main() {
    std::ifstream my_file;
    my_file.open("files/1.board");
    if (my_file) {
        std::cout << "The file stream has been created!" << "\n";
        std::string line;
        while (getline(my_file, line)) {
            std::cout << line << "\n";
        }
    }
}
```

Compile & Execute | Explain

Loading terminal (id_6gag5bi), please wait...

Recap

That's it! To recap, there are essentially four steps to reading a file:

1. `#include <fstream>`
2. Create a `std::ifstream` object using the path to your file.
3. Evaluate the `std::ifstream` object as a `bool` to ensure that the stream creation did not fail.
4. Use a `while` loop with `getline` to write file lines to a string.

On to an Exercise

Have a careful look at the code above for reading file lines into the code. In the next exercise, you will write a function to do this in your program.