## Reading from and Writing to a File

**C++ text file operations require the include file `fstream`.** This is in addition to `iostream`. A text file is opened as an `ifstream`-type object. The extraction (>>) operator can then be used to read data into variables from the file. The insertion (<<) operator can be used to write information from variables to a file. The file to be read must be placed within the project. On Repl.it, this is accomplished by clicking Add file on the left-hand side while you have your code open.

Once a file has been opened and read from, you can close a file using the `close()` member function. Files should be closed once finished with the reading in process. To re-open a file use `open("filename.txt")` the member function.

The name of the file can be entered directly as literal strings, or using a string variable with the `c_str()` function attached as in the following example.

```
string filename;
cin>>filename;
ifstream inFile(filename.c_str());
```

## Reading from a File Examples

The following segment reads and displays **integers** from the text file `testnum`, until the end of the file is reached.

```
int x;
ifstream inFile("testnum");
if (inFile.fail())
{
  cout << "File not found.";
   exit(1);
}
else
{
  while (inFile >> x)
    {
    cout << x;              //Here is where the code is reading out the #s
    }
  inFile.close();
}
```

Single characters can be read from an `ifstream` object with the `get` method. The following segment displays the file `testchar.txt` one **character** at a time.

```
char ch;
ifstream inFile("testchar.txt");
if (inFile.fail())
{
  cout << "File not found.";
  exit(1);
}
else
{
   while (inFile.get(ch))
     {
      cout << ch;
      }
   inFile.close();
}
```

Lines of text can be read from an `ifstream` object with the `getline` method. The following segment displays the file `test.txt` one line at a time, as a **string**.

```
string line;
ifstream inFile("test.txt");
if (inFile.fail())
{
  cout << "File not found.";
  exit(1);
}
else
{
   while (getline(inFile,line))
      {
      cout << line;
      }
   inFile.close();
}
```

## Writing to a File Example

```
#include <iostream>
#include <fstream>                        // For file input/output

using namespace std;

int main()
{
  ofstream outFile("numbers.txt"); // Open the output file
  if (outFile.fail())
  {
     cout << "Unable to open output file.";
     exit (1);                           //terminates program; file not found
  }
 else
  {
    for (int i = 0; i < limit; i++)  // Write out some values
    {
      outFile << value[i] << endl;
    }
   outFile.close();
  }
  return 0;
}
```