

File input and output

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IOSTREAM

- Up to this point, we have always been using cout and cin.
- cout: output on the screen
- cin: Input from the keyboard

But sometimes we want to get input from a file,
or output to a file.

FSTREAM

- The library that performs that role is called `fstream`.

```
#include <fstream>
```

OFSTREAM

- ofstream stands for output file stream, which outputs to the file we specified.

```
ofstream f("outputfile.txt");
```

- To output we simply do the following:

```
f << "hello";
```

-Note: The direction of the arrow is the same as our cout <<.

OFSTREAM

Just as we can output a bunch of stuff using for loops and cout. We can do the same thing to outputfile.txt.

```
for(int i = 0; i < 10; i++) {  
    for(int j = 0; j < 10; j++){  
        f << "hello" << " ";  
    }  
    f << endl;  
}
```

This will output 10 by 10 table of "hello" to the output file.

IFSTREAM

- ifstream stands for input file stream, which reads the data from a file.

```
ifstream f("outputfile.txt");
```

- Just as we need data structures (variables, arrays) to store the input in cin>> statements, we need data structures here too.

```
string line;
```

```
f>> line;
```

- This will read a string from the file to store it into line variable.

We can see what is in the variable by doing
cout << line; // we will see the output hello on the screen.

IFSTREAM

- If we want to read in an entire line from the file, we can use `getline()` function.

`getline(f, line)`

- This will read in an entire line from the output file and stores into the variable `line`.

`cout<< line; // We will expect to see 10 words of hello on the screen.`

EOF

- Sometimes it is helpful to use eof function from fstream. You can use this function like this:

```
while(!f.eof()) {  
    getline(f, line);  
    cout << line << end;  
}
```

This while loop will keep reading the file line by line until the end of the file.

Output.cpp

- `#include <iostream>`
- `#include <fstream>`
- `using namespace std;`
- `int main() {`
- `ofstream f("outputfile.txt");`
- `string names[10][10];`
- `for(int i = 0; i < 10; i ++)` {
- `for(int j = 0; j < 10; j++) {`
- `f << "hello" << " ";`
- `}`
- `f << endl;`
- `}`
- `return 0;`
- `}`

Input.cpp

- `#include <iostream>`
- `#include <fstream>`
- `#include <string>`
- `using namespace std;`
- `int main() {`
- `ifstream f("outputfile.txt");`
- `string line;`
- `while(!f.eof()) {`
- `getline(f, line);`
- `cout << line << endl;`
- `}`
- `return 0;`
- `}`