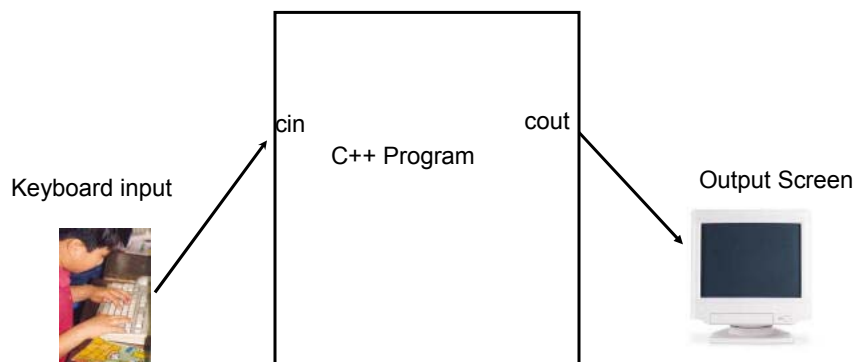


Programming with Data Files

Chapter 4

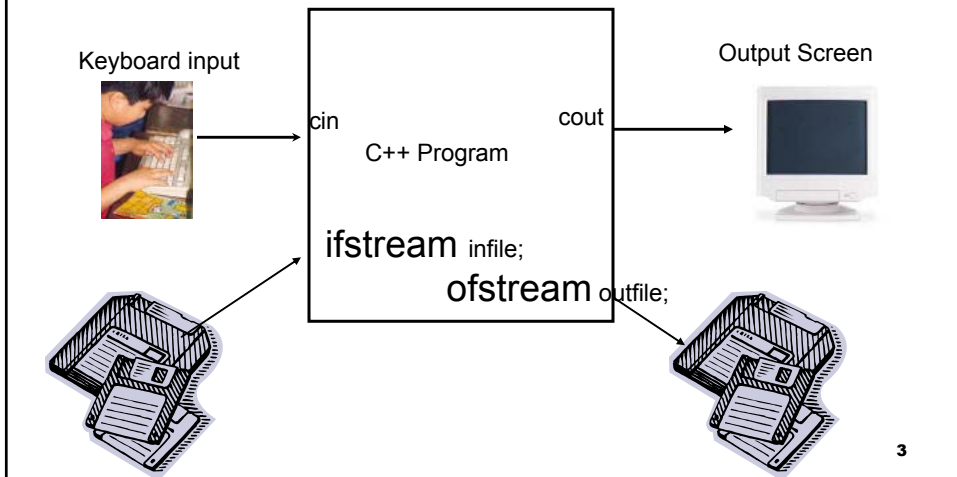
1

Standard Input Output



2

File Input / Output features



Programmer Defined File Streams

- To define your own file streams
 - for input use ifstream class
 - for output use ofstream class
- ifstream and ofstream are defined in package fstream

File Operations

- Open, close, << and >> operators
- eof() operation on an input file object returns a true or false (Boolean)
- get() reads a single character from an input file and put(char) writes a single character into an output file.

5

Defining File Streams

1. Include **fstream**
2. declare file stream variable (object)
 1. **ifstream fin;**
 2. **ofstream fout;**
3. use open() to initialize file stream variable
4. use input file stream variable as you would use **cin** and use output file stream variable as you would use **cout**
5. use close() to close the file when finished with it

6

```

#include <fstream>
#include <cmath>
using namespace std;
int main()
{ //Create three columns of data for plotting.
  double x;
  ifstream xdata; //declare input stream
  ofstream plotdata; //declare output stream
  xdata.open("data1"); //xdata uses file data1
  if( xdata.fail() ) //check for error
  { cout << "error opening input file" << endl;
    return 0;
  } //end if fail
  plotdata.open("plot1");//plotdata uses file plot1
  xdata >> x; //input x from file
  while(!xdata.eof()) //while not end of file
  { if( x>0 ) //write to plot file
    plotdata<<x<<" "<<exp(x)<<" "<<log(x)<<endl;
    xdata >> x; //get next data point
  } //end while
  xdata.close();
  plotdata.close();
  return 0;
} //end main

```

7

Reading Data Files

- Specified number of records
 - for loop
- Trailer or Sentinel Signal
 - while loop
- Data records only (no specified number of records, no sentinel value)
 - while loop

8

Example - Specified Number of Records

```
...
int main()
{
    fstream fin("data");
    double x;
    int num_data_points;

    ...
    fin >> num_data_points;
    for(int i=0; i<num_data_points; i++)
    {
        fin >> x;
        ...
    }
    ...
}
```

9

Example - Sentinel Signal

```
const double sentinelValue = -99;

...
int main()
{
    fstream fin("data");
    double x;

    ...
    fin >> x;
    while(x != sentinelValue)
    {
        ...
        fin >> x;
    }
    ...
}
```

10

Example - No Specified Number of Records, no Sentinel Signal

```
...
int main()
{
    fstream fin("data");
    double x;

    ...
    fin >> x;
    while( !fin.eof() )
    {
        ...
        fin >> x;
    }
    ...
}
```

11

Summary

- We looked at
 - Standard Input and Output
 - File Input and output features
 - Programmer Defined Files
 - File operations
 - Reading multiple data sets from input file

12