PFI lecture File input output

- So far we use “cout” and “cin” in our porgram for output to the screen and input from the keyboard.
- **File input output** allows us output and input information to and from a file.
- To use files, we need include **fstream** header file
  - use **ifstream** data type for input files
  - use **ofstream** data type for output files
  - use **fstream** data type for both input, output files
  - Can use >>, << to read from, write to a file
  - Can use **eof** member function to test for end of input file

PFI lecture file

- “cout” and “cin” are **file objects** (variables) that have been defined for us. They are associated with the standard output (terminal) and standard input (keyboard) respectively.
- To use file, we need to declare and define **file objects** of our own (object may be thought of as a variable).
  - **fstream** dout; // type is fixed, we may use any name
  - **fstream** din;
- We need to associate a file object with a **physical file** in the file system on the disk.
  - din.open(“numbers.txt”); // calling a member function

PFI lecture file

- Reading an integer from numbers.txt file after making the association.
  - int val;
  - din >> val; // see the similarity to cin >> val;

PFI lecture file

```
#include <iostream>
#include <fstream>
using namespace std;
int main()
{
   int a[10]={};
   ifstream din;  // declaring file object or variable
   din.open("numbers.txt");  // associate to physical file
   //read in upto 10 values from file numbers.txt into array a
   for (int i=0; i < 10 && din >> a[i]; i=i+1)
         // no body
         ;
   // output non zero values upto 10
   for (int i=0; i < 10 && a[i]; i=i+1)
         cout << a[i] << ' ';
   cout << endl;
   din.close();
   return 0;
}
```

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```
Content of numbers.txt file:
2
3
5
7
11
13
```

PFI lecture file

```
Program output:
2 3 5 7 11 13
```

PFI lecture file

```
#include <iostream>
#include <fstream>
using namespace std;
int main()
{
   int a[10]={};
   ifstream din;
   din.open("numbers.txt");
   //read in upto 10 values from file numbers.txt into array a
   for (int i=0; i < 10 && din >> a[i]; i=i+1)
         // no body
         ;
   ofstream dout;
   dout.open("outfile.txt");
   // output non zero values upto 10
   for (int i=0; i < 10 && a[i]; i=i+1)
         dout << a[i] << ' ';
   dout << endl;
   din.close();
   dout.close();
   return 0;
}
```

PFI lecture File object

- Cin, cout, and user defined **file objects** such din, dout are **class objects** and they have **member functions**.
  - cin.get(ch) // ch type char, get one character from buffer
  - cout.put(ch) // output one character
  - din.eof() // test to see if end of file (eof) is reached
- Online document or reference can be used to learn more or to look up if we do not remember all