File Access (7.5)

CSE 2031
Fall 2011

Declaring and Opening Files

```
FILE *fp; /* file pointer */
FILE *fopen(char *name, char *mode);
```

Example:

```
FILE *ifp, *ofp;
char iname[50], oname[50];
ifp = fopen( iname, "r" );
if ( ifp == NULL ) { ... }
ofp = fopen( oname, "w" );
```

Modes

```
fp = fopen( name, "r" );
```

- Returns NULL if file does not exist, or has no read permission.

```
fp = fopen( name, “w" );
```

- If file does not exist, one will be created for writing.
- If file already exists, the content will be erased when the file is opened. So be careful!
- Returns NULL if file has no write permission.

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Modes (cont.)

```
fp = fopen( name, “a" );   /* append */
```

- If file does not exist, one will be created for writing.
- If file already exists, the content will be preserved.
- Returns NULL if file has no write permission.

- May combine multiple modes.

```
fp = fopen( name, "rw" );
```

File may be read first, but the old content will be erased as soon as something is written to the file.

```
fp = fopen( name, "ra" );
fp = fopen( name, “aw" );  /* same as “a” */
```

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Reading and Writing Files

```
int getc( FILE *fp )
int putc( int c, FILE *fp )
int fscanf( FILE *fp, char *format, ... )
int fprintf( FILE *fp, char *format, ... )

int c;
while ( (c = getc( ifp )) != EOF )
   putc( c, ofp );

char ch;
while ( fscanf(  ifp, "%c", &ch ) != EOF )
   fprintf(  ofp, "%c", ch );
```

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Closing Files

```
int fclose( FILE *fp )

fclose( ifp );
fclose( ofp );
```

- Most operating systems have some limit on the number of files that a program may have open simultaneously ⇒ free the file pointers when they are no longer needed.
- **`fclose`** is called automatically for each open file when a program terminates normally.
- For output files: **`fclose`** flushes the buffer in which **`putc`** is collecting output.

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Reminder: I/O Redirection

- In many cases, I/O redirection is simpler than using file pointers.

```
a.out < input_file > outout_file
```

```
a.out < input_file >> outout_file
```