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CHAPTER 11 FILE INPUT & OUTPUT

Introduction to Computer Science Using Ruby

File Access: Reading & Writing

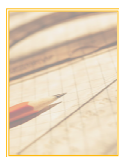
- Files can be manipulated using **File Input/Output (I/O)**
- To access files, the built-in Ruby **File Class** is used

File contains multiple methods:

- ▣ **open**
- ▣ **close**
- ▣ **gets**
- ▣ **puts**

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File Access: Reading & Writing



- The method **File.open** instantiates a new file object
 - ▣ Enables Ruby to read from or write to an existing or new file
 - ▣ The file object returned by File.open can then be used to access the file specified in the File.open statement

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File Access: Reading & Writing

- The following code shows how to open a file:


```
my_file = File.open(file_name, access_mode)
```
- The **my_file** variable is a File object that can now be used to interact with the file's contents
- The **file_name** is the name of the file in the system – it is highly system dependant

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File Access: Reading & Writing

The way `my_file` functions depends on what access mode is used. The two main modes are:

Mode	Description
r	Read access only. Points to start of the file. This is the default, but it is considered good programming to specify it anyway.
w	Write access only. Points to the beginning of the file which will overwrite the file's contents if it already exists.

Table 11.1: Some Access Modes

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File Access: Reading & Writing



- To read a line of characters from a file, call the `gets` method
 - ▣ `gets` will read a new line each time
 - ▣ Returns nil when it reaches the end of the file

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Example 11.1: Sample Code for File Reading

```

1 file = File.open("foo.txt", "r")
2 whole_file = ""
3
4 while (input_line = file.gets)
5   whole_file += input_line
6 end
7
8 puts "Contents of input file:"
9 puts whole_file

```

Note: Reads and prints the "foo.txt." file

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File Access: Reading & Writing

- Writing to a file is similar to reading from a file
 - ▣ Instead of using read mode, use "w" for writing access
 - ▣ To output text to a file, use a **local variable** and invoke the `puts` method


```
file.puts("text goes here.")
```

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Example 11.2: File Read/Write Example

This code writes input into a file:

```

1 file_a = File.open("bar.txt", "w")
2
3 puts "Please enter a line of text"
4 line = gets
5 file_a.puts(line)
6 file_a.close
7
8 file_b = File.open("bar.txt", "r")
9 puts "Contents of file:"
10 puts file_b.gets

```

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File Reader Class



- We can now define a class which **encapsulates file reading**
- The next example encapsulates reading and displaying a file

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Example 11.3: File Reader Class

```

1 class FileReader
2
3   def initialize(file_name)
4     @file = File.open(file_name, "r")
5   end
6
7   def read_file
8     whole_file = ""
9     while (input_line = @file.gets)
10      whole_file += input_line
11    end
12
13    return whole_file
14  end
15
16  def display
17    puts "Contents of input file:"
18    puts read_file
19  end
20 end

```

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Example 11.3 Cont'd

```

21 def close
22   @file.close
23 end
24 end

```

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Example 11.4: File Writer Class

```

1 class FileWriter
2
3   def initialize(file_name)
4     @file = File.open(file_name, "w")
5   end
6
7   def write_line(output_line)
8     @file.puts(output_line)
9   end
10
11  def close
12    @file.close
13  end
14 end

```

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Example 11.5: FileReader/FileWriter Example

```

1 require_relative "file_reader.rb"
2 require_relative "file_writer.rb"
3
4 fr = FileReader.new("input.txt")
5 fw = FileWriter.new("output.txt")
6
7 input = fr.read_file
8 fw.write_line(input)
9
10 fw.close
11 fr.close

```

This example uses the FileReader and FileWriter classes to read a file, then writes its contents to another file

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File Reader/Writer Example



- Test the program using Example 11.6:
Sample Input File

```

Hello World!
A mighty fine day for ruby
programming!
Computer Science is the best!

```

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Summary



- We described the basic file input and output operations
- Note that Ruby allows other file operations that are not covered in these lectures.

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