

Defining and using methods

The following two programs work exactly like *srchspc.java* and *update.java*, but define methods (*first_word*, *read_file*, and *write_file*) to perform some of the operations. The methods are called from *main*. The examples illustrate the concepts of modular design and procedural abstraction. Program code is often easier to write and understand if it is divided into short modules. Even a two-line method, like *main* in *update2.java*, is not too short to be well designed.

Note that the method *first_word* in *srchspc2.java* returns a *String* object, while *read_file* and *write_file* in *update2.java* return no values and are used for their side effects. All three methods happen to take *String* parameters.

```
/*
srchspc2.java:
Prompts for a line of text, displays
the first word.

D. Keil 4/08
*/
import java.util.Scanner;

public class srchspc2
{
    private static String first_word(String s)
    // Returns characters of s up to 1st space
    {
        // Find first space:
        int i = 0, spaceloc = 0;
        boolean found = false;
        while (i < s.length() && !found)
        {
            if (s.charAt(i) == ' ')
            {
                spaceloc = i;
                found = true;
            }
            i = i + 1;
        }
        return s.substring(0, spaceloc);
    }

    public static void main(String[] args)
    {
        // Prompt for line:
        System.out.print("Enter a string: ");
        Scanner cin = new Scanner(System.in);
        String buf = cin.nextLine();

        // Select first word:
        buf = first_word(buf);

        // Display the part of the string up to
        // and including the space:
        System.out.println("Hello " + buf);
    }
}
```

```
/* update2.java:
Reads a string from file 'update.txt',
prompts for update of string, updates file.
D. Keil 4/08
*/
import java.util.Scanner;
import java.io.FileReader;
import java.io.PrintWriter;
import java.io.FileNotFoundException;

public class update2
{
    private static void read_file(String name)
    throws FileNotFoundException
    // Open input file, read and display string.
    {
        System.out.print("Reading "+name);
        FileReader reader = new FileReader(name);
        Scanner fin = new Scanner(reader);
        String buf = fin.nextLine();
        fin.close();
        System.out.println("File contents:\n"+buf);
    }

    private static void write_file(String name)
    throws FileNotFoundException
    // Prompt for new string, write to file
    {
        // Prompt for new string:
        System.out.print("Enter new text to store: ");
        Scanner cin = new Scanner(System.in);
        String buf = cin.nextLine();

        // Write new string to file:
        PrintWriter fout = new PrintWriter(name);
        System.out.print("Saving "+buf+" to "+name);
        fout.println(buf);
        fout.close();
    }

    public static void main(String[] args)
    throws FileNotFoundException
    {
        read_file("update.txt");
        write_file("update.txt");
    }
}
```