APPENDIX

This appendix is a compendium of information on Pascal that students may not have seen in an introductory course and which is important in a data structures context. These topics were originally included in the text (primarily in Chapter 1). In the interest of identifying these topics and allowing the familiar or rushed reader to skip them on a first reading, we have placed them in this appendix. The topics are not related to one another and can be covered individually in any order, or assigned as independent reading when convenient.

1. SCALAR DATA TYPES IN PASCAL

The Pascal language contains four basic data types: *integer*, *real*, *boolean*, and *char*. In most computers, these four types are native to the machine's hardware. Section 1.1 describes how integers, reals, and characters can be implemented in hardware. A boolean variable can be implemented by a single bit which has the value 1 to represent *true* and 0 to represent *false*.

There are two other kinds of scalar types in Pascal. (A ***scalar*** type is a type whose variables each contain only a single value, as opposed to arrays, records, or sets, which are composed of several values.) The first is the ***enumeration type***, in which the programmer specifies a set of identifiers as the possible values of objects of the type being defined. For example, the declaration

```
type fruittype = (apple, orange, pear, banana);
```

defines an enumeration type *fruittype*. An object of this type can have one of the four constant values *apple*, *orange*, *pear*, *banana*. If we then declare