

- Ⓜ 14. Let `shape` be the structure tag declared in Exercise 13. Write functions that perform the following operations on a `shape` structure `s` passed as an argument:
- (a) Compute the area of `s`.
 - (b) Move `s` by `x` units in the `x` direction and `y` units in the `y` direction, returning the modified version of `s`. (`x` and `y` are additional arguments to the function.)
 - (c) Scale `s` by a factor of `c` (a `double` value), returning the modified version of `s`. (`c` is an additional argument to the function.)

Section 16.5

- Ⓜ 15. (a) Declare a tag for an enumeration whose values represent the seven days of the week.
 (b) Use `typedef` to define a name for the enumeration of part (a).
16. Which of the following statements about enumeration constants are true?
- (a) An enumeration constant may represent any integer specified by the programmer.
 - (b) Enumeration constants have exactly the same properties as constants created using `#define`.
 - (c) Enumeration constants have the values 0, 1, 2, ... by default.
 - (d) All constants in an enumeration must have different values.
 - (e) Enumeration constants may be used as integers in expressions.

- Ⓜ 17. Suppose that `b` and `i` are declared as follows:

```
enum {FALSE, TRUE} b;
int i;
```

Which of the following statements are legal? Which ones are “safe” (always yield a meaningful result)?

- (a) `b = FALSE;`
 - (b) `b = i;`
 - (c) `b++;`
 - (d) `i = b;`
 - (e) `i = 2 * b + 1;`
18. (a) Each square of a chessboard can hold one piece—a pawn, knight, bishop, rook, queen, or king—or it may be empty. Each piece is either black or white. Define two enumerated types: `Piece`, which has seven possible values (one of which is “empty”), and `Color`, which has two.
- (b) Using the types from part (a), define a structure type named `Square` that can store both the type of a piece and its color.
- (c) Using the `Square` type from part (b), declare an 8×8 array named `board` that can store the entire contents of a chessboard.
- (d) Add an initializer to the declaration in part (c) so that `board`’s initial value corresponds to the usual arrangement of pieces at the start of a chess game. A square that’s not occupied by a piece should have an “empty” piece value and the color black.
19. Declare a structure with the following members whose tag is `pinball_machine`:
- `name` – a string of up to 40 characters
 - `year` – an integer (representing the year of manufacture)
 - `type` – an enumeration with the values `EM` (electromechanical) and `SS` (solid state)
 - `players` – an integer (representing the maximum number of players)
20. Suppose that the `direction` variable is declared in the following way:
- ```
enum {NORTH, SOUTH, EAST, WEST} direction;
```