7 Unit 7: Functions

Functions are the building blocks of C programs. So far the programs have consisted of only one function, the main function. Book Chapter 9 provides several examples on how to declare and call functions. The section on Variable-Length Array Parameters (pages 198-200) can be skipped, we will not use this feature in any of the programming projects. However, for those who are interested in the details, the `printf` function is implemented using this feature.

7.1 Project 16: Chess Board Evaluation

Write the following function, which evaluates a chess board:

```
int evaluate_board(char board[8][8]);
```

The 2-dimensional array 'board' represents a configuration of pieces on the chess board, where the letters K,Q,R,B,N,P represent white pieces, and the letters k,q,r,b,n, and p represent Black pieces. The function 'evaluate_board' should sum the values of the White pieces (Q=9 (Queen), R=5 (Rook), B=3 (Bishop), N=3 (Knight), P=1 (Pawn)). The empty field, written as '.', counts 0. It should also sum the values of the Black pieces (done in a similar way for the corresponding lower-case letters). The function will return the difference between the two numbers. This value will be positive if White has an advantage in material and negative if Black has an advantage.
Hint:

- We do not consider the King in the sum, because both players always have to have a King.
- It is not necessary to check whether the board is a legal configuration.

The program does not prompt the user with an input question. It immediately reads from the standard input stream. Each row of the board consists of 8 characters and is terminated by a new-line character. A board always consists of 8 rows. The program computes the board's value, and prints the score. You can print the board, but only for your own test purposes. The program that is handed in produces as output only the score of the board as "Score: " followed by the computed value. Note, you are not allowed to change the signature of the function 'evaluate_board' (=types of parameters). This function must exist in your program and must be called.

```
% u7_chessboard
rnbqkbnr
pppppppp
........
........
........
........
PPPPPPPP
RNBQKBNR
Score: 0
%
```