**L D.9** (a) Consider the MATLAB function whose source code is given in the listing below. This MATLAB function takes a matrix $t$ and returns the matrix obtained by replacing each element in $t$ with its square. The implementation of the MATLAB function that is given is overly verbose, due to its unnecessary use of looping constructs (i.e., two **for** loops). Rewrite the code so that it is much more concise by eliminating all looping constructs.

Listing D.10: `func_1a.m`

```
function x = func_1a(t)
    for row = 1 : height(t)
        for col = 1 : width(t)
            t_value = t(row, col);
            x(row, col) = t_value ^ 2;
        end
    end
end
```

(b) Consider the MATLAB function whose source code is given in the listing below. This MATLAB function takes a scalar $t$ and returns $x(t)$, where

$$x(t) = \begin{cases} t^2 & 1 \leq t < 2 \\ t & 2 \leq t < 5 \\ 0 & \text{otherwise.} \end{cases}$$

The implementation of the MATLAB function given is overly verbose due to its unnecessary use of a conditional statement (i.e., **if** statement). Rewrite the code to be more concise by eliminating the use of any conditional statements. (Note that the `&&` operator and `&` operator have different semantics.)

Listing D.11: `func_2a.m`

```
function x = func_2a(t)
    if t >= 1 && t < 2
        x = t ^ 2;
    elseif t >= 2 && t < 5
        x = t;
    else
        x = 0;
    end
end
```

(c) Consider the MATLAB function whose source code is given in the listing below. This MATLAB function takes a matrix $t$ and applies the function $x$ element-wise to $t$, where

$$x(t) = \begin{cases} t^2 & 1 \leq t < 2 \\ t & 2 \leq t < 5 \\ 0 & \text{otherwise.} \end{cases}$$

The implementation of the MATLAB function given is overly verbose due to its unnecessary use of both looping constructs and conditional statements. Rewrite the code to be much more concise by eliminating the use of all looping constructs and conditional statements. (Note that the `&&` operator and `&` operator have different semantics.)

Listing D.12: `func_3a.m`

```
function x = func_3a(t)
    for row = 1 : height(t)
```

```
        for col = 1 : width(t)
            t_val = t(row, col);
            if t_val >= 1 && t_val < 2
                x(row, col) = t_val ^ 2;
            elseif t_val >= 2 && t_val < 5
                x(row, col) = t_val;
            else
                x(row, col) = 0;
            end
        end
    end
end
```

 