

PHYSICAL MODELING IN MATLAB

EXERCISE 2.3

Write a script, called *car_update*, that updates the number of cars in Albany and Boston from one week to the next. The input, A and B, will be the number of cars in Albany and Boston, respectively, at the beginning of the week; the output will be the number of cars that are at each site at the start of the next week given that 5 percent of the cars rented in Albany get returned in Boston and that 3 percent of the cars rented in Boston get returned in Albany.

The MATLAB script *car_update* contains:

```
% Exercise 2.3 - script car_update
%
% Will compute the number of rental cars at Albany and Boston at
% from week to week.
%
% It has been determined that each week 5% of the cars rented in
% Albany are dropped off in Boston and that 3% of the cars rented in
% Boston are dropped off in Albany.
%
% Will use the round function to round the computed number of cars
% at each location to the nearest integer
%
% The number of cars in Albany from week to week is given by the
% number of cars at the start of the week, minus the number of cars
% that get returned in Boston, plus the number of cars that were
% rented in Boston and get returned in Albany
%
% A is the number of cars at the start of the week in Albany
% Anext is the number of cars in Albany at the start of the next
% week
Anext = A - A*0.05 + B*0.03;
%
% The number of cars in Boston from week to week is given by the
% number of cars at the start of the week, minus the number of cars
% that get returned in Albany, plus the number of cars that were
% rented in Albany that get returned in Boston
%
% B is number of cars at the start of the week in Boston
% Bnext is the number of cars in Boston at the start of the next
% week
Bnext = B - B*0.03 + A * 0.05;
%
% Display the number of cars in each location at the start of the
% next week
A = round(Anext)
B = round(Bnext)
```

To run:

```
% initialize A and B
A = 150;
B = 150;
```

```
% call the script to update the car totals
car_update;
% The displayed values of A and B reflect the new totals
```