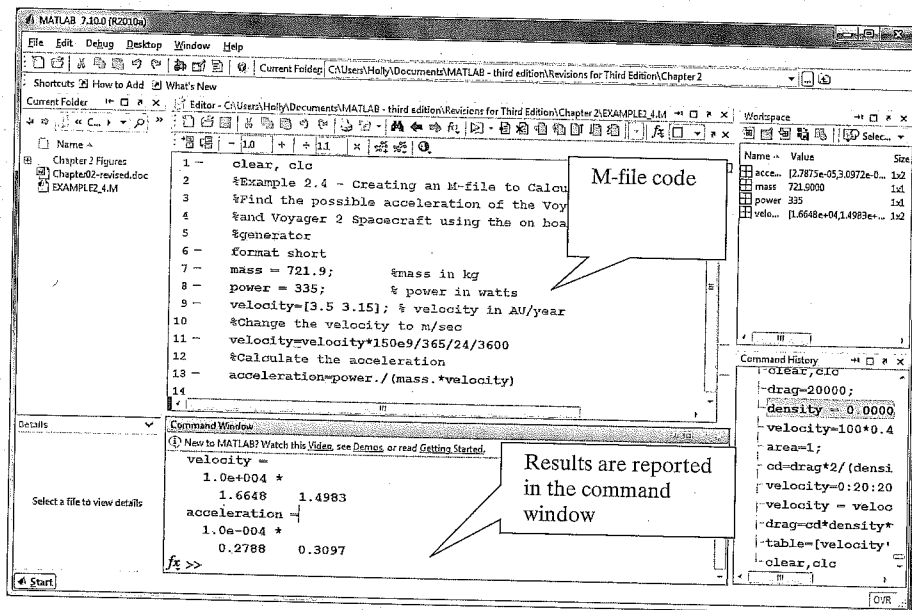


Figure 2.15

The results of an M-file execution print into the command window. The variables created are reflected in the workspace and the M-file is listed in the current folder window. The commands issued in the M-file are not mirrored in the command history.



To evaluate the program, select the Save and Run icon. The results are printed in the command window, as shown in Figure 2.15.

5. Test the Solution

Compare the MATLAB® results with the hand example results. Notice that the velocity and acceleration calculated from the hand example and the MATLAB® solution for *Voyager 1* match. The acceleration seems quite small, but applied over periods of weeks or months such an acceleration can achieve significant velocity changes. For example, a constant acceleration of $2.8 \times 10^{-5} \text{ m/s}^2$ results in a velocity change of about 72 m/s over the space of a month:

$$2.8 \times 10^{-5} \text{ m/s}^2 \times 3600 \text{ s/h} \\ \times 24 \text{ h/day} \times 30 \text{ days/month} = 72.3 \text{ m/s}$$

Now that you have a MATLAB® program that works, you can use it as the starting point for other, more complicated calculations.

2.4.4 Cell Mode

New to MATLAB® 7 is a utility that allows the user to divide M-files into sections, or cells, that can be executed one at a time. This feature is particularly useful as you develop MATLAB® programs. To activate the cell mode, select

Cell → Enable Cell Mode

from the menu bar in the edit window, as shown in Figure 2.16. Once the cell mode has been enabled, the cell toolbar appears, as shown in Figure 2.17.

To divide your M-file program into cells, you can create cell dividers by using a double percentage sign followed by a space. If you want to name the cell, just add a name on the same line as the cell divider:

```
% Cell Name
```

KEY IDEA

Cell mode is new to MATLAB® 7

KEY IDEA

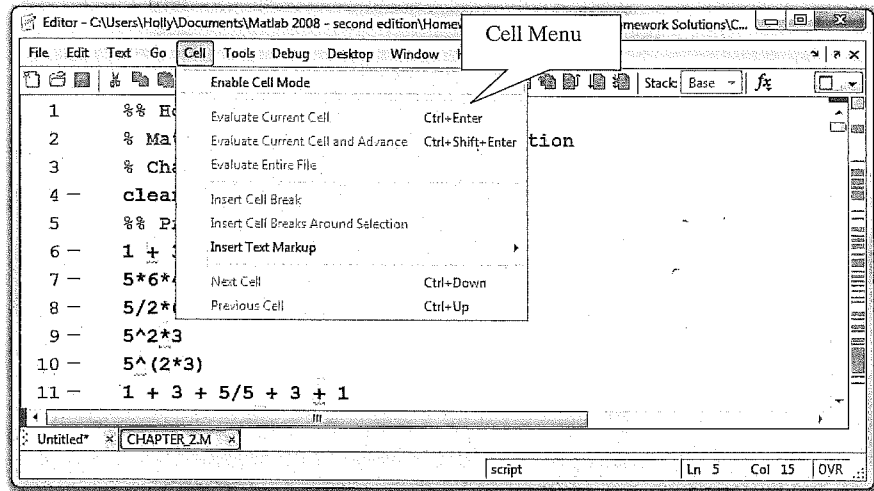
Cell mode allows you to execute portions of the code incrementally

CELL

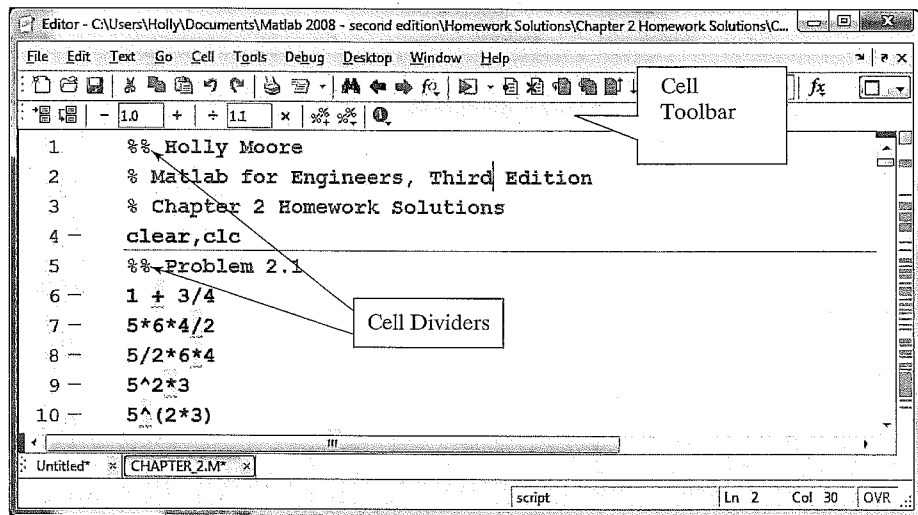
A section of MATLAB® code located between cell dividers (%%)

Figure 2.16

You can access the cell mode from the menu bar in the edit window.

**Figure 2.17**

The cell toolbar allows the user to execute one cell, or section, at a time.



It's important to include the space after the double percentage sign (%%). If you don't, the line is recognized as a comment, not a cell divider.

Once the cell dividers are in place, if you position the cursor anywhere inside the cell, the entire cell turns pale yellow. For example, in Figure 2.17, the first four lines of the M-file program make up the first cell. Now we can use the evaluation icons on the cell toolbar to evaluate a single section, evaluate the current section and move on to the next section, or evaluate the entire file. Also on the cell toolbar is an icon that lists all the cell titles in the M-file, as shown in Figure 2.18.

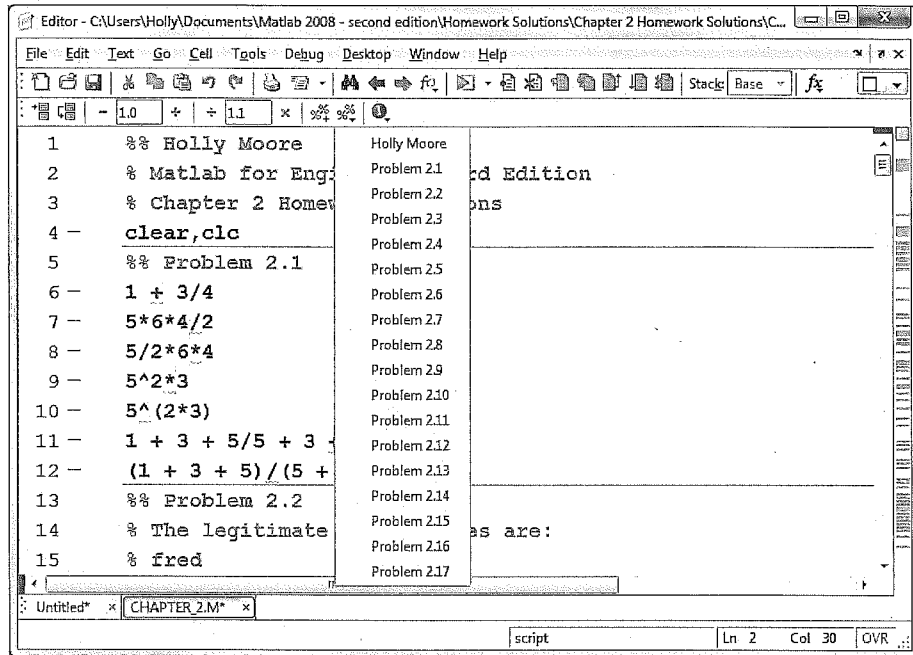
Figure 2.18 shows the first 14 lines of an M-file written to solve some homework problems. By dividing the program into cells, it was possible to work on each problem separately. Be sure to save any M-files you've developed this way by selecting **Save** or **Save As** from the file menu:

File → **Save**

or

File → **Save As**

Figure 2.18
The show cell titles icon lists all the cells in the M-file.



The reason for using these commands is that in cell mode, the program is not automatically saved every time you run it.

Dividing a homework M-file into cells offers a big advantage to the person who must evaluate it. By using the **evaluate cell and advance** function, the grader can step through the program one problem at a time. Even more important, the programmer can divide a complicated project into manageable sections and evaluate these sections independently.

SUMMARY

In this chapter, we introduced the basic MATLAB® structure. The MATLAB® environment includes multiple windows, four of which are open in the default view:

- Command window
- Command history window
- Workspace window
- Current folder window

In addition, the

- Document window
- Graphics window
- Edit window

open as needed during a MATLAB® session.

Variables defined in MATLAB® follow common computer naming conventions:

- Names must start with a letter.
- Letters, numbers, and the underscore are the only characters allowed.

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