Topics: Variable & assignment, input & output
Reading (CFile): Sec 1.1, 1.2
(KU): Sec 3.4

Example: surface area of a sphere

```matlab
% Example 1_1: Compute surface area of a sphere
% A: surface area of the sphere
% r: radius of the sphere

r= input('Enter the radius: ');
A= 4*3.14159*r*r;
fprintf('Surface area is %7.2f.
', A);
```

Anatomy of a program

- input
- calculation
- output
- comments

Definitions

- **Algorithm**: a set of procedures for solving a problem
- **Program**: an algorithm written in some language
- **Variable**: a named memory space for storing a value
- **Assignment**: the action of putting a value into a named space (variable)
- **Expression**: a combination of operators and operands (variables, constants) that evaluate to a value

Input & output statements

Input: \[ \text{variable} = \text{input('prompt')} \]
Output: \[ \text{disp('words to be displayed')} \]
\[ \text{fprintf('Value of x is %f, not %d!
', x, y)} \]

Comments

- Use comments for readability!
- Start each program with a *concise* description of what it does
- Define each important variable/constant
- Top a block of code for a specific task with a *concise* comment
- A comment starts with the “%” symbol and goes to the end of the line
**Example: expanding sphere**

Modify the previous program to calculate the increase in surface area given an increase in the radius of a sphere. We will call this program `diffArea`—you will use it in the lab later.

% Example 1_2: Explore how the surface area of a sphere changes with an increase in the radius.

```matlab
r = input('Enter radius r in miles: ');
delta = input('Enter delta r in inches: ');

fprintf('Increase in area (mile^2) is %f\n', incr);
```

```matlab
% Example 1_2: Explore how the surface area of a sphere changes with an increase in the radius.

r = input('Enter radius r in miles: ');
delta = input('Enter delta r in inches: ');

fprintf('Increase in area (mile^2) is %f\n', incr);
```