

# ECE 257 - LESSON 5

## INTRODUCTION TO FORMATTING AND I/O

SPRING 2007

A.P. FELZER

### IN CLASS

#### STANDARD FORMATS

1. Default formats for integers and strings of characters

```
x1 = 3245
x2 = 'ab12'
```

2. Format short - Default format for real numbers

```
x1 = 6.54e-3
x2 = 6.54e-4
x3 = 6.54321e2
x4 = 6.54321e3
```

- a. What does format short do

3. Format long

```
x = pi
format long;
x = pi
format short;
x = pi
```

- a. What does format long do
- b. How does changing the format affect the number of decimal places being stored in the computer

4. Format bank

```
x = 25.345
format bank;
x
format short;
x
```

- a. What does format bank do

#### ROUNDING

5. Rounding of positive numbers

```
x = 12.345;
x_round = round(x)
x_fix = fix(x)
x_ceil = ceil(x)
x_floor = floor(x)
```

- a. What does each of these rounding functions do to positive numbers

## 6. Rounding of negative numbers

```
x = -12.345;  
x_round = round (x)  
x_fix = fix (x)  
x_ceil = ceil (x)  
x_floor = floor (x)
```

- What does each of these rounding functions do to negative numbers
- What general statements can we make about what these rounding functions do to positive and negative numbers

## 7. Application of rounding

```
>> x = round (rand)
```

- How can this code be used to simulate the flipping of a fair coin

## 8. The sign function

```
>> sign (3)  
>> sign (0)  
>> sign (-3)
```

- What does the sign function do

## INPUTTING OF DATA

### 9. Inputting a number from the user

```
>> x1 = input ('Enter the day of the month you were born: ')  
>> x2 = input ('Enter the day of the month you were born: ');
```

- What is the affect of the semicolon

### 10. Inputting a vector from the user

```
>> x = input ('Enter the 1x2 vector x: ')
```

- How does Matlab know a vector is being inputted

### 11. Inputting a string of characters from the user

```
>> x1 = input ('Enter your initials: ', 's')  
>> x2 = input ('Enter the day of the month you were born: ', 's')
```

- How does Matlab know whether the data being entered is a number or a string of characters
- How can you tell from the workspace whether a variable is a number or a character

## DISPLAYING OF OUTPUT

### 12. Displaying of character strings

```
>> disp ('abc')  
>> disp ('abc' 'def')  
>> disp (['abc' 'def'])  
>> x = 'abc';  
>> y = 'def';  
>> disp ([x y])
```

- a. What works and what doesn't

13. Displaying of calculated results

```
>> x = 3.4;  
>> disp(['x = ' x])  
>> disp(['x = ' num2str(x)])
```

- a. What did we have to do to get disp to display the value of x

## FORMATTING OF OUTPUT

14. Printing numerical results in standard format

```
>> x = 12.345;  
>> fprintf('The value of x = %f\n', x)
```

- a. What does %f do
- b. What does \n do
- c. How does Matlab know what variable to output

15. Printing numerical results in specified formats

```
>> x = 12.345;  
>> fprintf('The value of x = %5.2f\n', x)  
>> fprintf('The value of x = %8.2f\n', x)  
>> fprintf('The value of x = %8.3f\n', x)  
>> fprintf('The value of x = %3.2f\n', x)
```

- a. What does the 8 in the format 8.3 do
- b. What does the 3 in the format 8.3 do
- c. What happens when the format is 3.2
- d. How is fprintf different from disp

## OUTPUTTING TO EXCEL

16. Sending a file to EXCEL

```
x = 1:5;  
y = 2*x;  
w = [x' y']  
xlswrite('excel_test', w)
```

- a. What does xlswrite do