

MATLAB Seminar

CS Grad Seminars

Outline

1. MATLAB Basics
2. Matrix Manipulations
3. Using .m Files
4. Plotting Graphs
5. Creating Functions

MATLAB Basics

- Arithmetic Stuff
- Constants
 - pi
 - i (or j)
 - Inf, NaN

MATLAB Basics

- Simple Functions

- `cos(30)`, `cos(pi)` - similarly for `sin`, `tan`
- `sqrt()`
- `log()`, `log2()`, `log10()`
- `conj(i)`, `conj(9i+5)` - conjugate of imaginary numbers
- `ceil()` - also, `floor()`
- `mod(10, 3)`
- `exp()` - same as e^x

MATLAB Basics

- Loops
 - while
 - for
- Variables
 - Case-sensitive
 - Alphanumeric, with at least one letter

Matrix Manipulations

- Creating a matrix:
 - $x = [1, 2, 3, 4]$
 - $y = [1, 4, 3; 4, 7, 6; 7, 1, 9]$
 - $v = 2:9$
 - $w = 2:2:6$
- Accessing - index starts from 1
 - $y(1, 2)$
 - $y(:, 3)$
 - $y(1:2, 2)$

Matrix Manipulations

- Operations

- `transpose(x)`
- `inv(y)`
- `x + v`
- `w * y`
- `y * w'` - inner dimensions must agree
- `sort(y)`
- `x .* v` - element-wise multiplication

Matrix Manipulations

- Others
 - `eye()`
 - `zeros()`, `ones()`
 - `diag()`

Using .m Files

Plotting Graphs

```
N=10; h = 2*pi/(N-1); x = -pi:h:pi;
```

```
y = cos(x)
```

```
plot(x, y, '-x')
```

```
title(' Plot of cos(x)')
```

Creating Functions

```
function[output variables] = fname([input variables])
```