CS 1132 lecture 2

I. Scripts
   A. Collect a sequence of commands together
      1. Batch execution
      2. Easy reuse
   B. Name of script is name of file (sans extension)
      1. Matlab looks for files matching command names in current folder
   C. Input, output interact with humans
   D. Variables live in common workspace
      1. Danger of contamination

II. Functions
   A. Inputs, outputs interact with other code
   B. Isolated temporary workspace (local scope)
   C. Syntax
      1. Declared with “function” keyword
      2. Filename must match function name
      3. May have multiple output parameters (return values)
      4. To use, call by invoking name, providing arguments for input parameters, and assigning return values to variables
      5. Comments after header used to generate documentation
   D. Matlab will search path after current directory

III. Monte Carlo methods
   A. Relate desired quantity to a probability
   B. Estimate probability via computer simulation
C. Example: estimate pi by throwing darts
   1. Top-down design

```
N = 100; L = 1;

% For each of N trials

   % Throw a dart

   % If it lands in circle

   % add 1 to total # of hits

% pi is 4*hits/N
```

IV. Repetition via for-loop (definite iteration)
   A. Loop syntax
   B. Loop variable
   C. Range expression
      1. Increment option (default: 1)
      2. Inclusive bounds (if consistent with increment)
      3. May go backwards
   D. Loop body

V. Uniform random numbers
   A. Scale and shift
VI. Conditional execution via if-statements

A. if, elseif, else syntax

B. Boolean expressions
   1. Relational operators
   2. Logical operators
      
      a) Short-circuit behavior