Lecture 08
Pseudocode, Algorithms

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Before we begin

HW4 Will be assigned tomorrow
HW3 Solutions will be posted
PL Prelim Topics
Today

- Pseudocode
- Number Guessing (Binary Search)
- Sorting Numbers (Bubble Sort)
Definitions

Algorithm
is a step-by-step description of a calculation, like a recipe. Examples: Prime Sieve, Binary Search, Bubble Sort.

Pseudocode
is a high-level description of a program or algorithm. It can be converted to a program easily.
% Create an array X of all 1's of length N
% Set X(1) to 0
% Find position k of next 1 in the X array
% If k is less than or equal to sqrt(N)
%   Set X(2*k), X(3*k), X(4*k) ... to zero
%   Go back to finding k
% Else
%   Find the indices of all 1's in X array
% These indices are prime numbers
numbergame.m

define number
    number = fix(10*rand);

define guess
    guess = input('enter a digit: ');

if number == guess
    disp('that is my number!');
else
    if number > guess
        disp('my number is greater');
    else
        disp('my number is smaller');
    end
end
number = fix(10*rand);
guess = -1;

while guess ~= number
    guess = input('enter a digit: ');
    if number == guess
        disp('that is my number!');
    else
        if number > guess
            disp('my number is greater');
        else
            disp('my number is smaller');
        end
    end
end
disp('Pick a number between 1–100!');
pause
high = 100; low = 1; trial = 0;

while 1
    guess = floor((high+low)/2);
    trial = trial + 1;
    fprintf('(Trial %d) Is it %d ? ', trial, guess);
    response = input('(y − Yes, d − Go down, u − Go up) ','s');
    switch response
        case {'y','Y'}
            disp('Yay!'); break;
        case {'u','U'}
            low = guess;
        case {'d','D'}
            high = guess;
        otherwise
            disp('Please enter ''y'', ''d'' or ''u''');
            response = input('(y − Yes, d − Go down, u − Go up) ','s');
    end
end