Lecture 18

Instructor Lecture and Matlab Demonstration:

Two codes with for-end loops:

money.m

% This code simulates the amount in a savings plan.
% input variables
% n = 480; % number of months
D = 100; % monthly deposit (should experiment with this)
A(1) = 100; % initial deposit
r = 0.06; % compound interest (should experiment with this)
% compute the monthly amounts
for i = 1:n
    A(i+1) = A(i) + (r/12)*A(i) + D;
end
% output the amounts
A(n+1)
plot(A)

integral.m

% This code uses the trapezoid rule to approximate an integral.
% input variables and create integrand function
% a = 0; % lower limit
b = 1; % upper limit
n = 10; % number of trapezoids (should experiment with this)
dx = (b-a)/n % base of trapezoids
% use the integrand 4/(1+x^2) given in the function
% function output = fun3(x)
% output = 4/(1+x^2);
% compute the area of the trapezoids and add them
x = a:dx:b
sumtrap = 0.0;
for i = 1:n
    hleft = fun3(x(i));
hright = fun3(x(i+1));
    areatrap = (hleft + hright)*.5*dx;
    sumtrap = sumtrap + areatrap;
end
% output integral approximation and error
% sumtrap
n
error = sumtrap - pi

Compound if-end command (if -else-end)

if single logical
    execution
else
    execution
end

function output = funjump1(t)
    if (t<4)
        output = t.^2;
    else
        output = t + 2;
    end

Example 8.2

Student Matlab Computations:

In money.m experiment with the interest and monthly deposits. Change to a retirement plan with large initial amount and monthly withdrawals.

In integral.m experiment with different number of trapezoids. Change the function to exp(-x^2) and integrate from -1 to 1.

Exercise 8.2

Student Multiple Choice Questions:

Go to moodle, login, choose ma116 and answer the multiple choice questions.