2.

Code:

Main script:

load hw7problem2.mat

N = 10;

A = intmat(a, b, N);

x = pinv(A) \* y;

t = 0:0.01:1;

f\_hat = zeros(length(t), 1);

for i = 1:length(t)

f\_hat(i) = polyval(x, t(i));

end

plot(f\_hat);

“intmat” function:

function [A] = intmat(a, b, N)

% a: M vector of lower limits

% b: M vector of higher limits

% N: degree

% A: M by N Matrix

M = size(a, 1);

% first cal y

coeffs = ones(N, 1);

poly\_matrix = zeros(M, N);

for idx = 1:N

coeffs(idx) = 1 / idx;

end

coeff\_matrix = diag(flipud(coeffs));

for row = 1: M

for col = 1: N

poly\_matrix(row, col) = b(row)^(N-col+1)-a(row)^(N-col+1);

end

end

A = poly\_matrix \* coeff\_matrix;

end

