**Lab Assignment # 3**

**1. Write MATLAB programs for** **Lagrange and Newton's Divided Difference (NDD) interpolating polynomials for**



Lagrange method:

x = [0 0.25 0.5 0.75];

y = [1 1.64872 2.71828 4.4869];

n = length(x)-1;

xp = 0.43;

sum = 0;

for i= 1:n+1

pr = 1;

for j=1 : n+1

if j~=i

pr = pr \*( (xp-x(j))/(x(i)-x(j)) );

end

end

sum = sum + y(i)\*pr;

end

disp(sum); ans = 2.3603

Newton’s Divided Difference :

x = [0 0.25 0.5 0.75];

y = [1 1.64872 2.71828 4.4869];

n = max(size(x));

x0 = 0.43;

for i=1 : n

D(i,1) = y(i);

end

sum = 0;

for j= 2:n

for i=j : n

D(i,j) = (D(i,j-1)-D(i-1,j-1))/(x(i)-x(i-j+1));

end

end

pr = 1;

for i=2:n

pr = pr\*(x0-x(i-1));

sum = sum + pr \* D(i,i);

end

disp(sum);