Advance Numerical Technique

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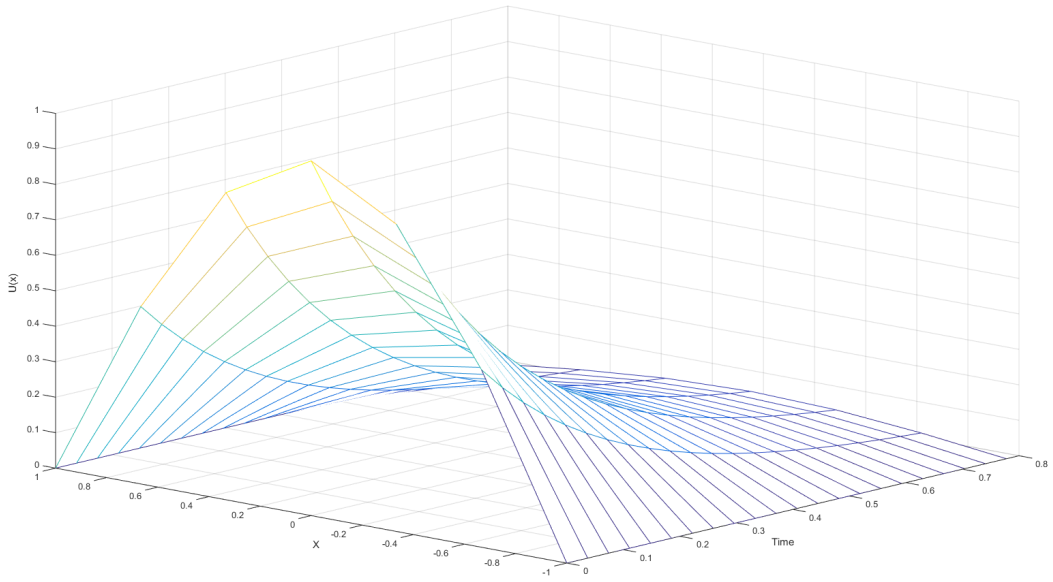
Q.1 Solve using Crank Nicolson Method

du/dt = k * d2u/dx2
u(x,0) = cos pi*x/2
u(-1,t) = 0, u(1,t) = 0, t = 1

dt = 1/27
dx = 1/3

Solution :-



Q.2 Solve using Crank Nicolson Method and Fictitious Method

du/dt = k * d2u/dx2
u(x,0) = 1, 0 < x < 1
u(0,t) = u'(0,t), u(1,t) = -u'(1,t), t = 1

dt = 0.04;
dx = 0.2;
r = 1

Solution:-