MA423: Computational Finance Lab
Lab-01

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Question 1:

Given steps sizes to plot (dx, dt):

- (1e -02, 5e -04)
- (1e -03, 1e -03)
- (1e -04, 1e -02)

i) FTCS-

For all pairs of (dx,dt) the method is unstable because $r = \frac{dt}{dx^2} > 0.5$

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>> Lab1_Q1
Scheme is unstable - r > 0.5
Scheme is unstable - r > 0.5
Scheme is unstable - r > 0.5
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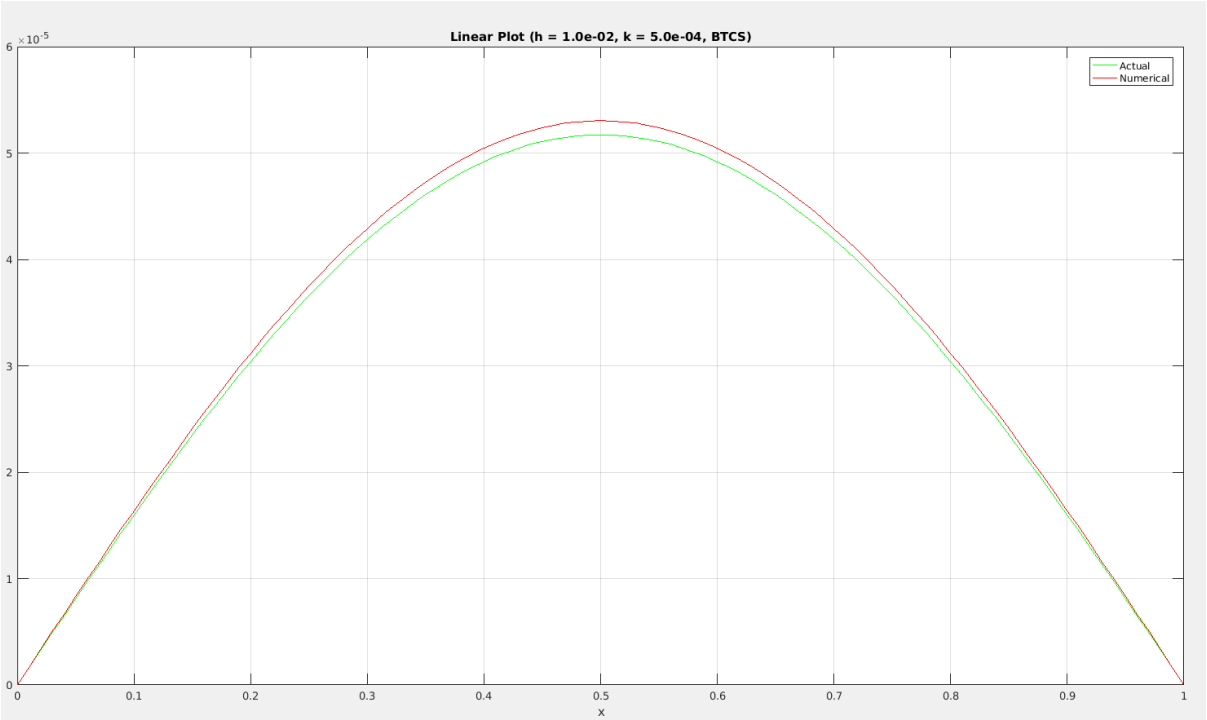
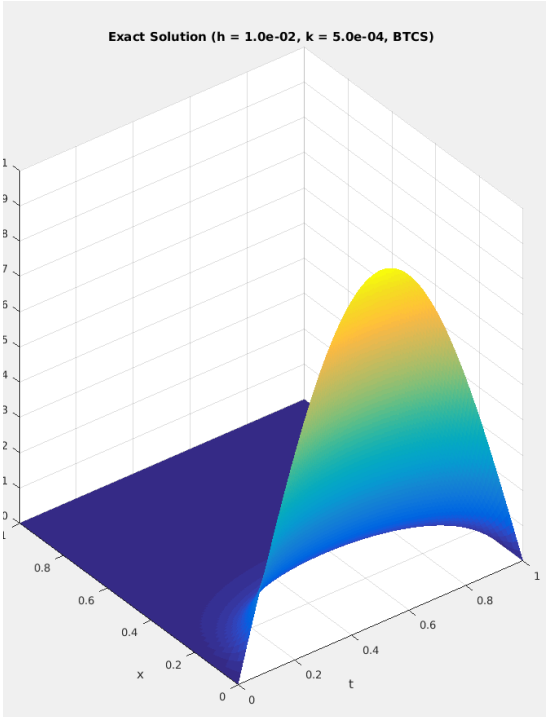
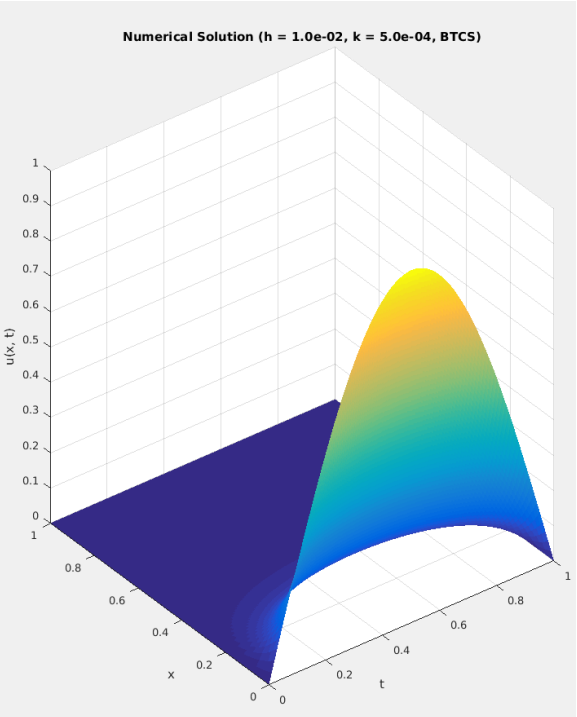
ii) BTCS- (Graphs on next page)

iii) Crank Nicolson- (Graphs on next page)

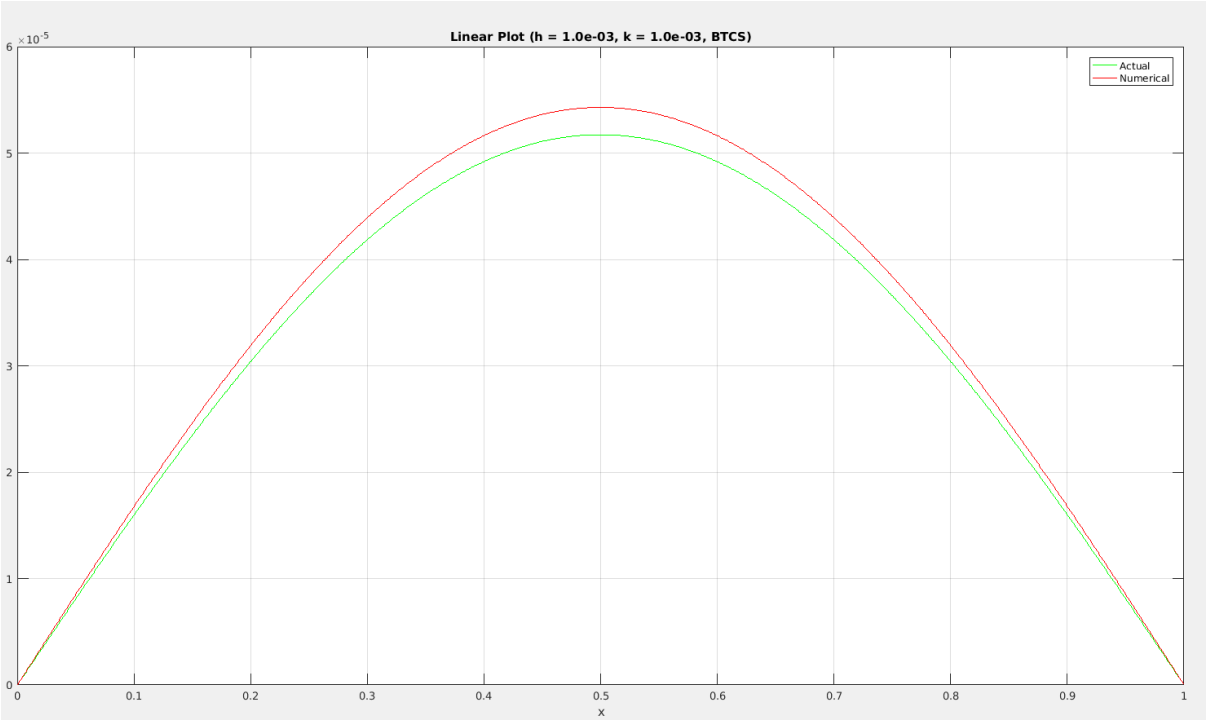
BTCS for h=0.01 and k=0.0005

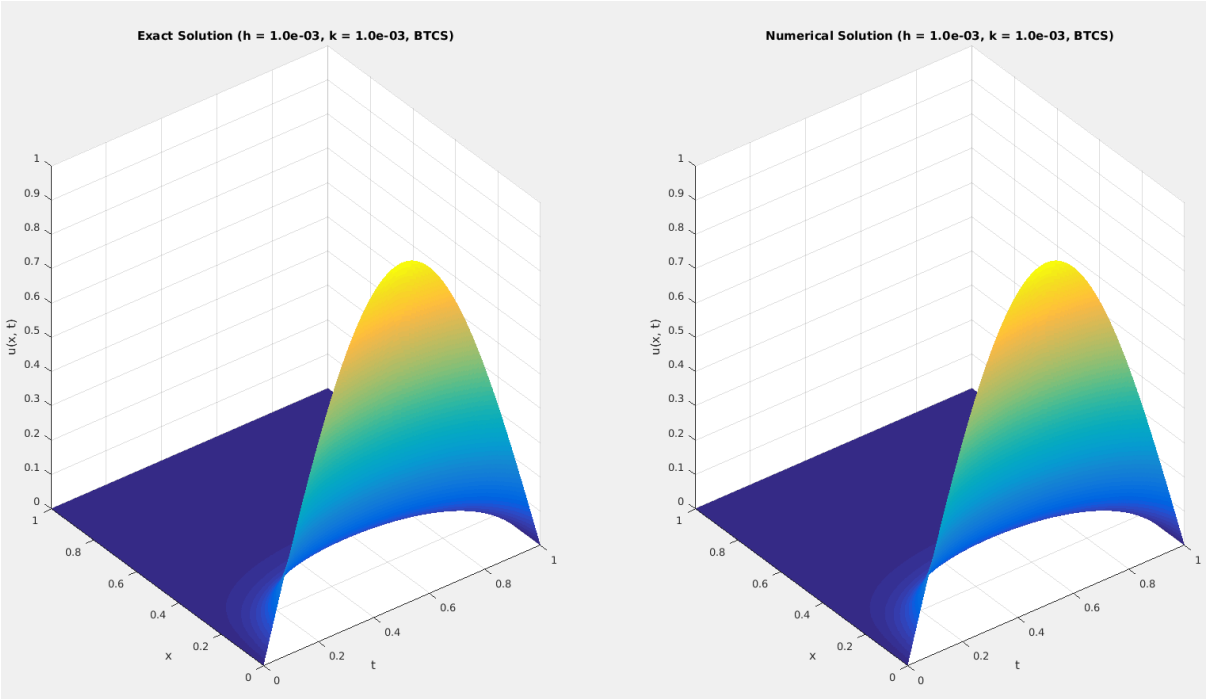




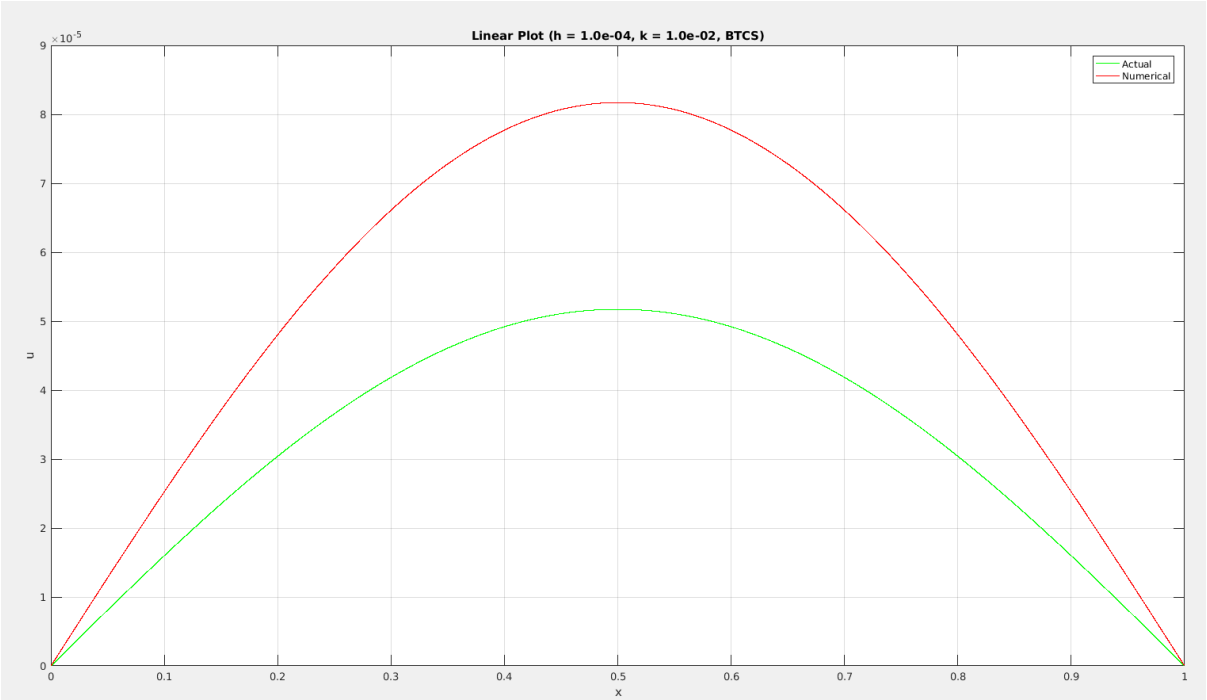


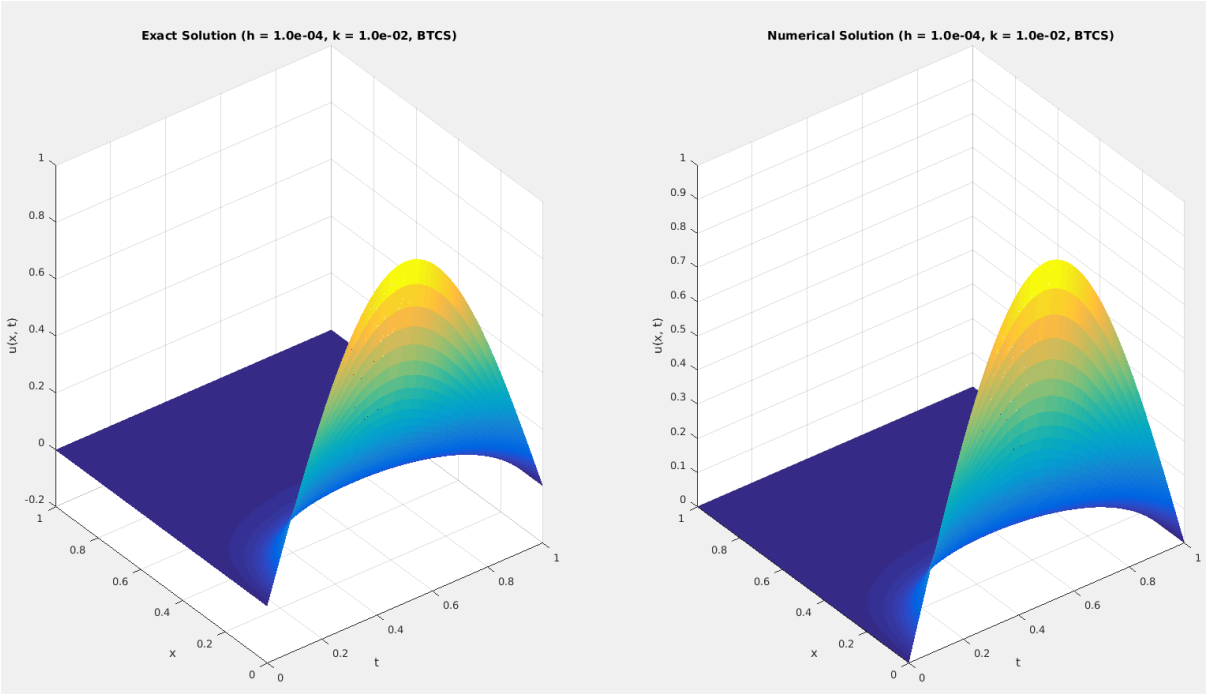
BTCS for h=0.001 and k=0.001



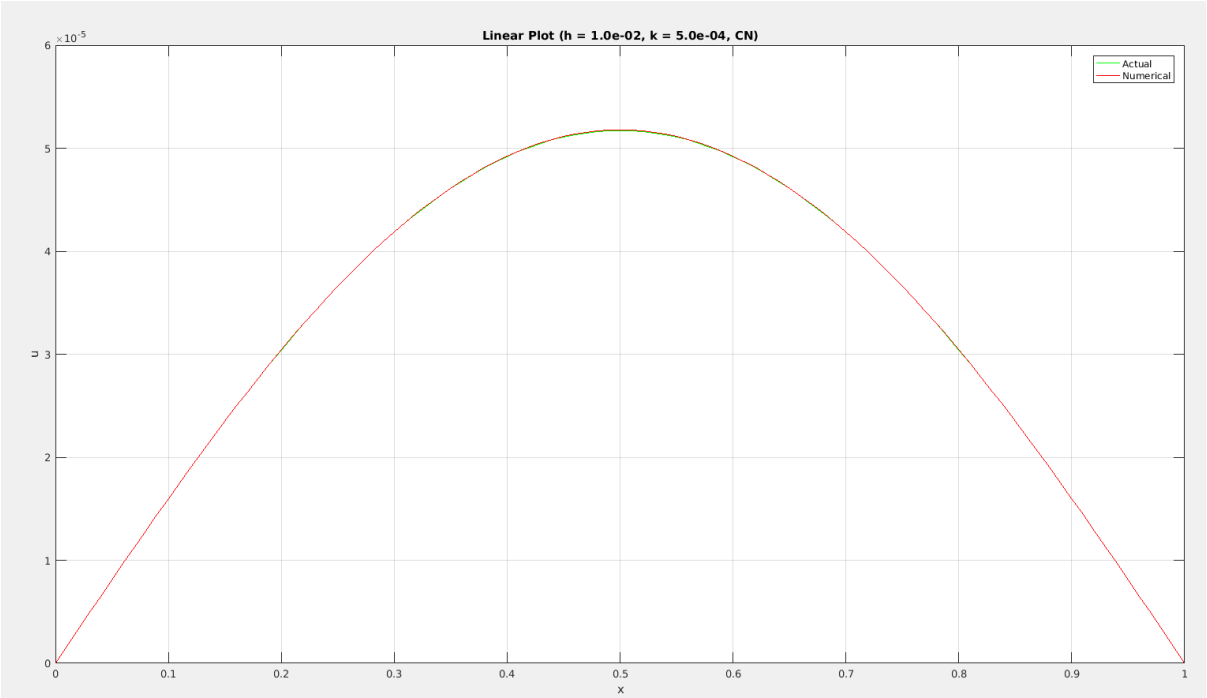


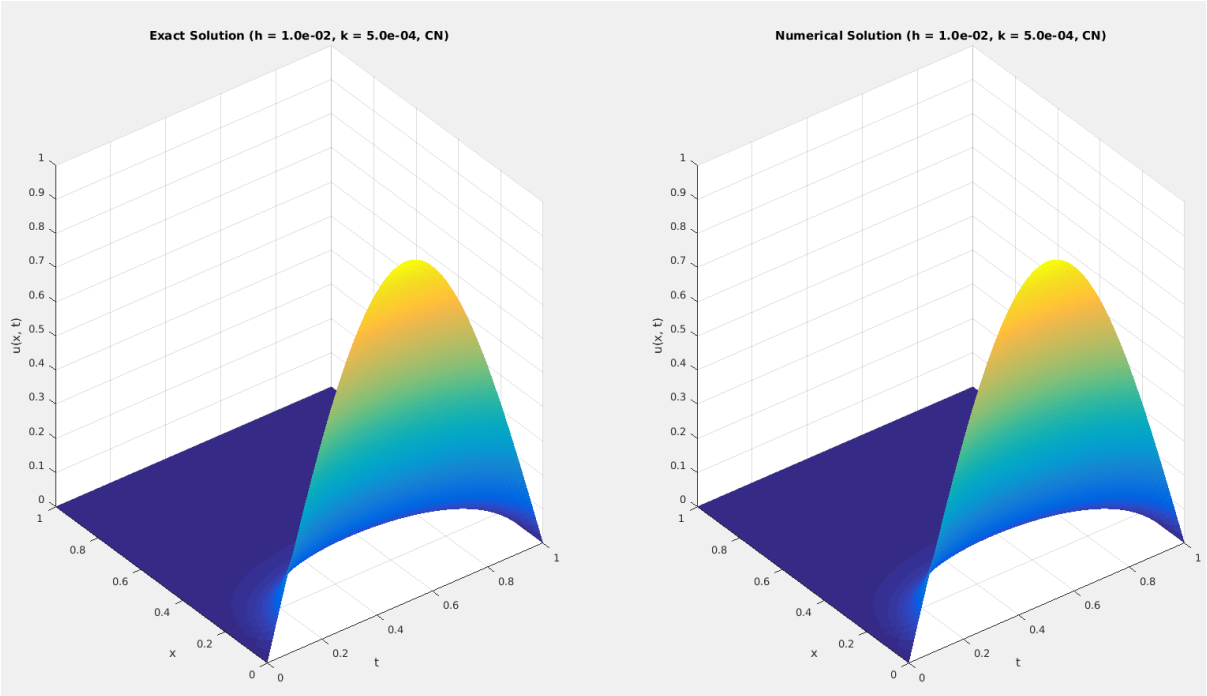
BTCS for h=0.0001 and k=0.01



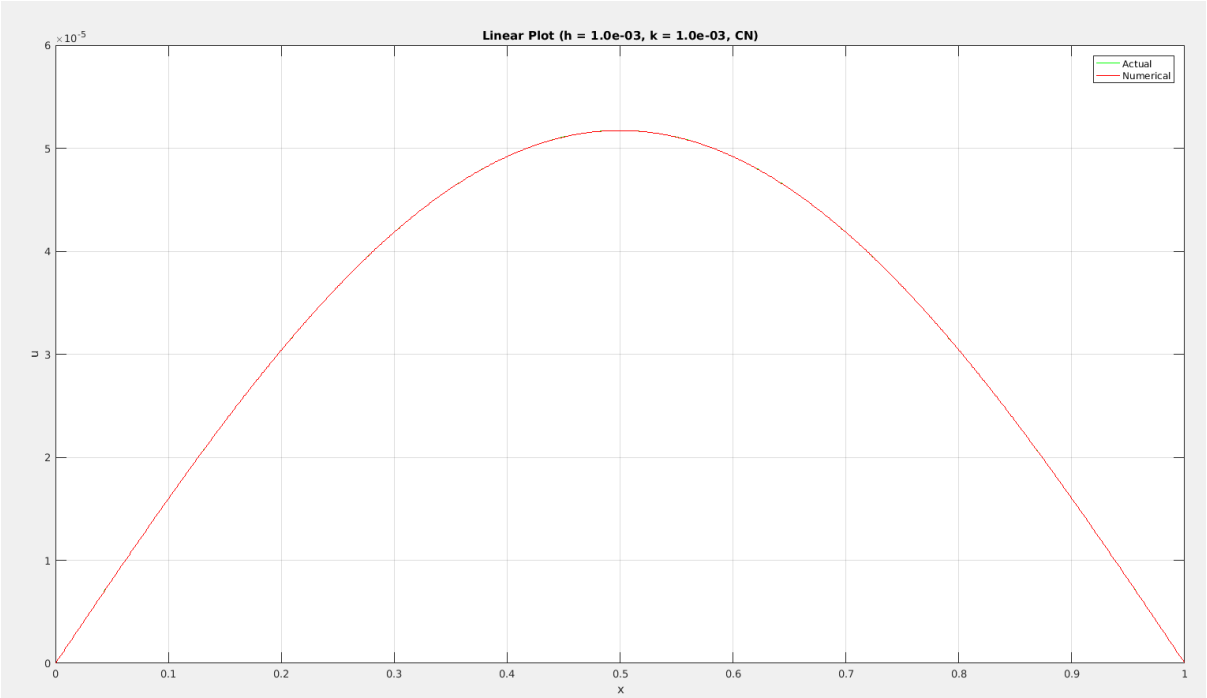


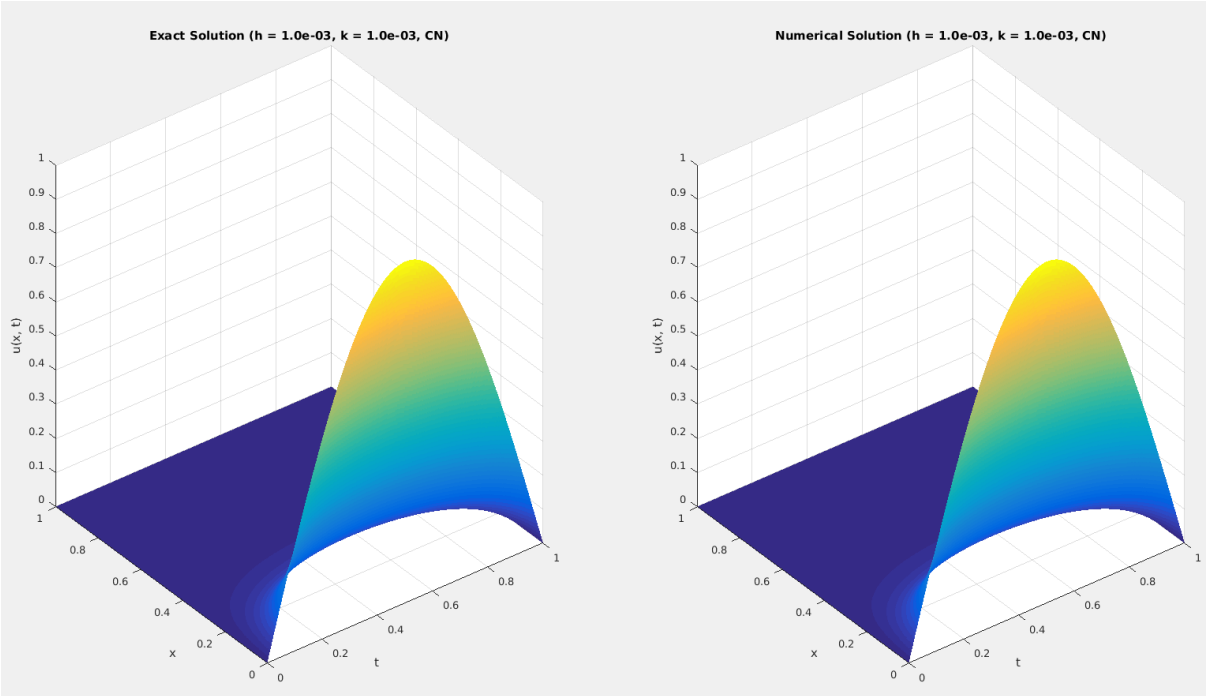
Crank Nicolson for h=0.01 and k=0.0005





Crank Nicolson for h=0.001 and k=0.001





Crank Nicolson for h=0.0001 and k=0.01