Assignment-7 and 8

Abheek Ghosh
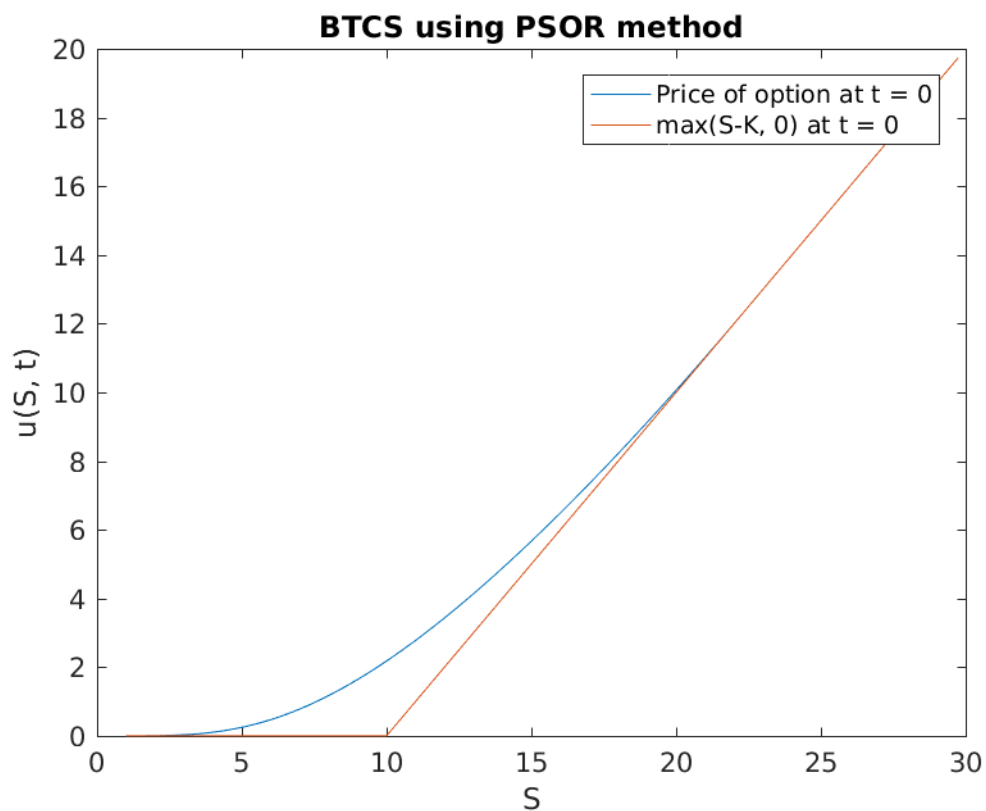
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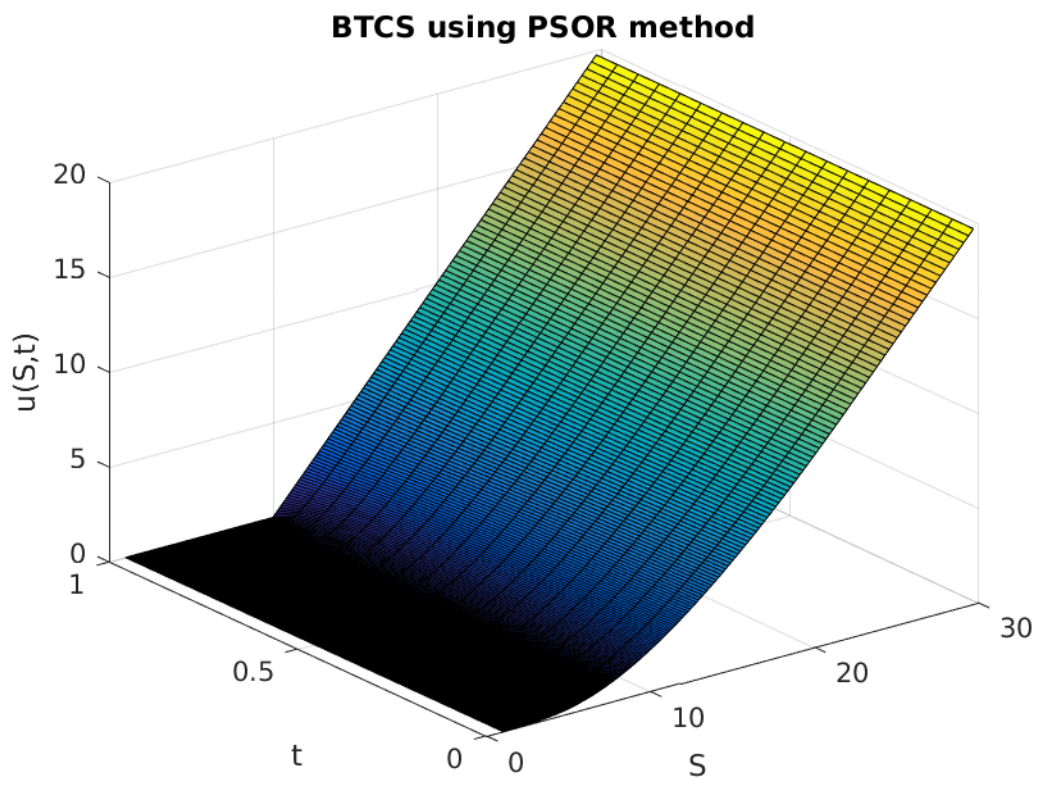
March 14, 2018
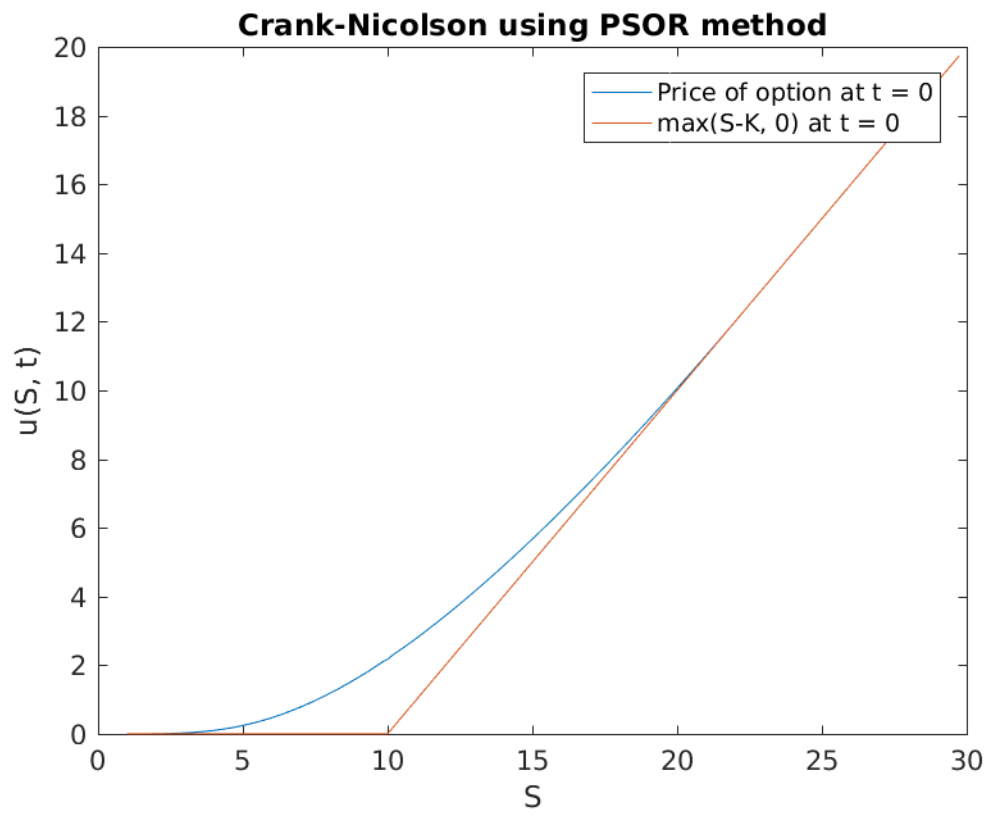
For extreme values of S (or x) the error in the plots is mainly due to the error in computing the boundary condition because we don't have $x = \infty$ and $-\infty$ as required. Our x has a small range -5 to 1.
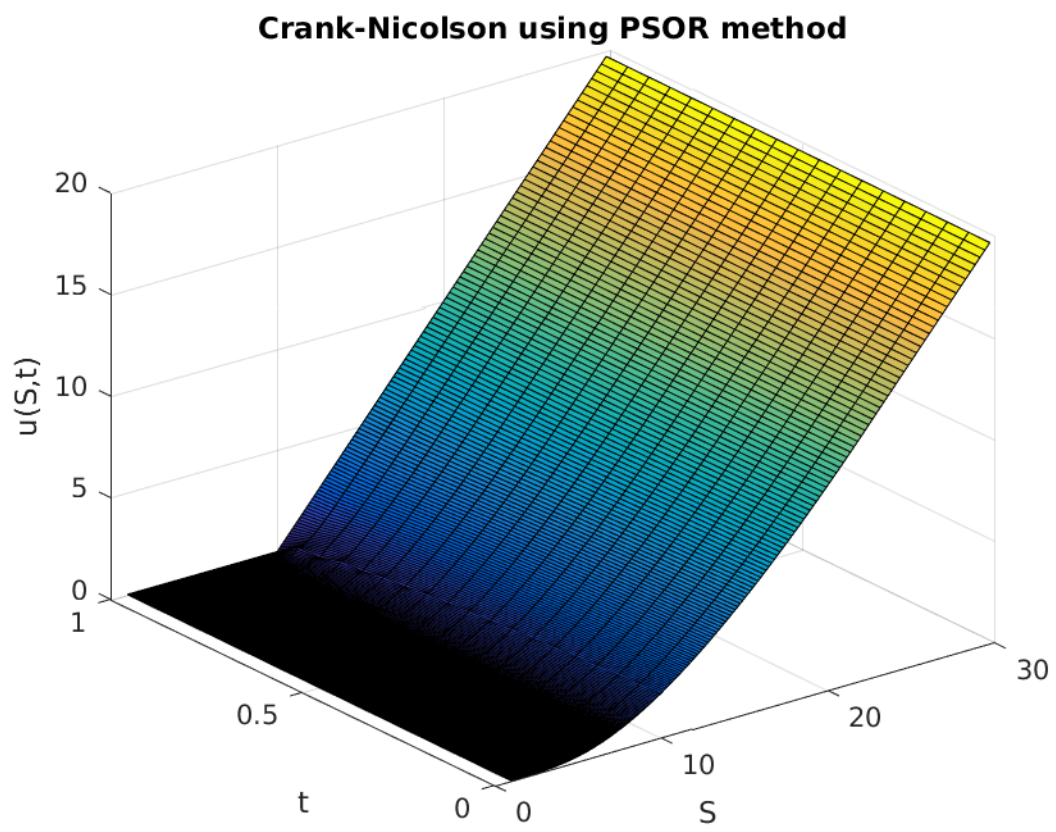
Question 1

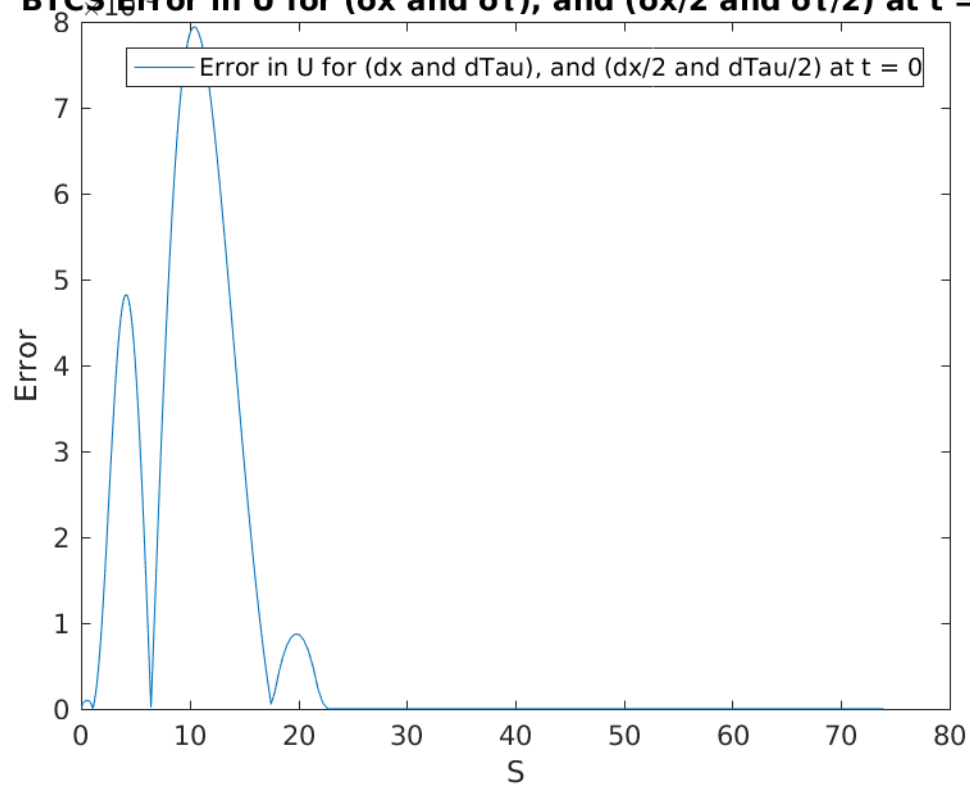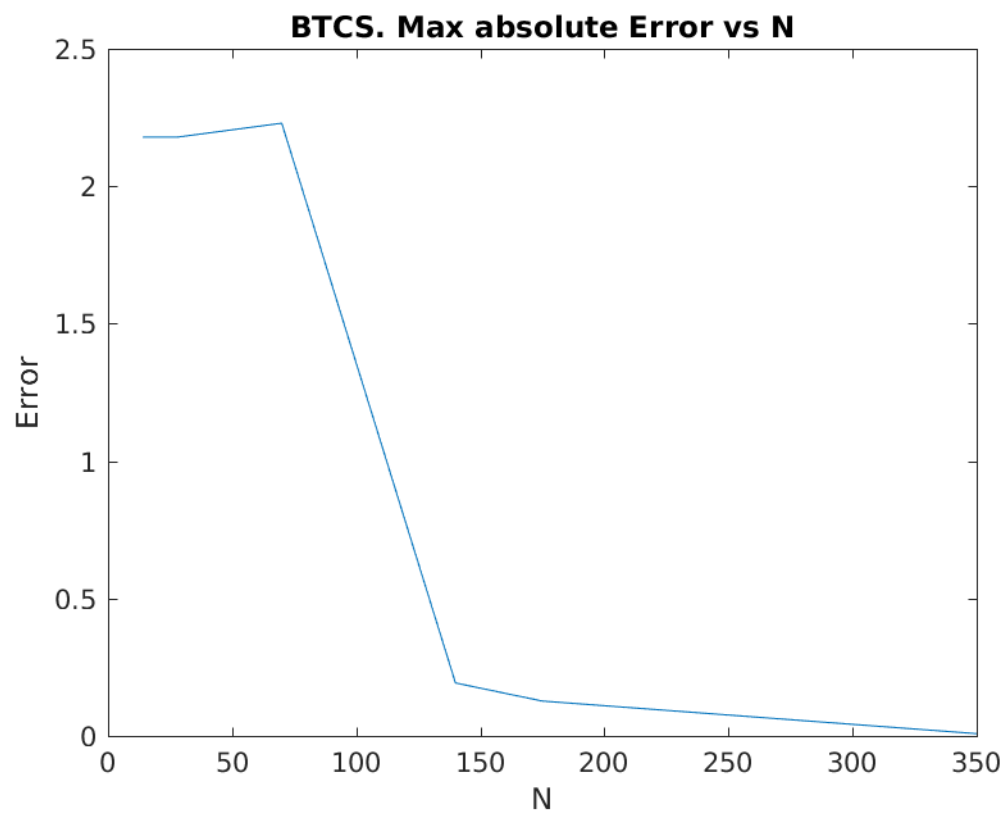Pricing American Call using BTCS and Crank-Nicolson along with PSOR method.
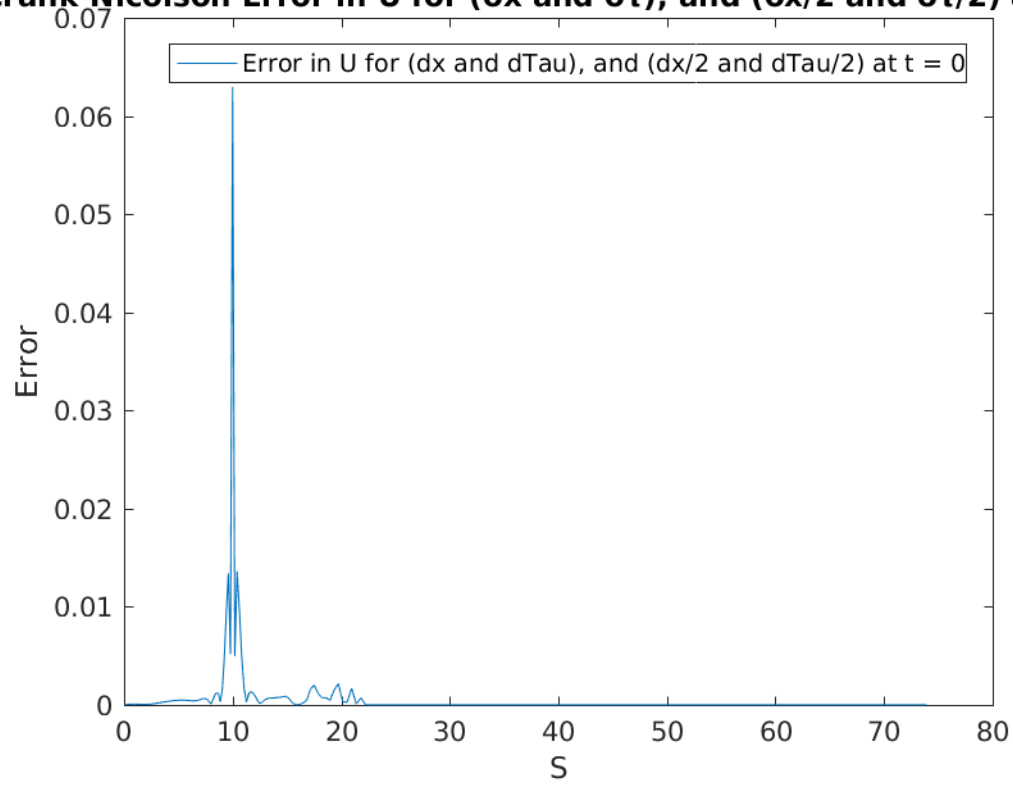
BTCS using PSOR method

Crank-Nicolson using PSOR method

Crank-Nicolson using PSOR method

Error in U for (δx and δτ), and (δx/2 and δτ/2) at t = 0

BTCS. Max absolute Error vs N

Crank-Nicolson Error in U for (δx and δτ), and (δx/2 and δτ/2) at t =

Crank-Nicolson. Max absolute Error vs N
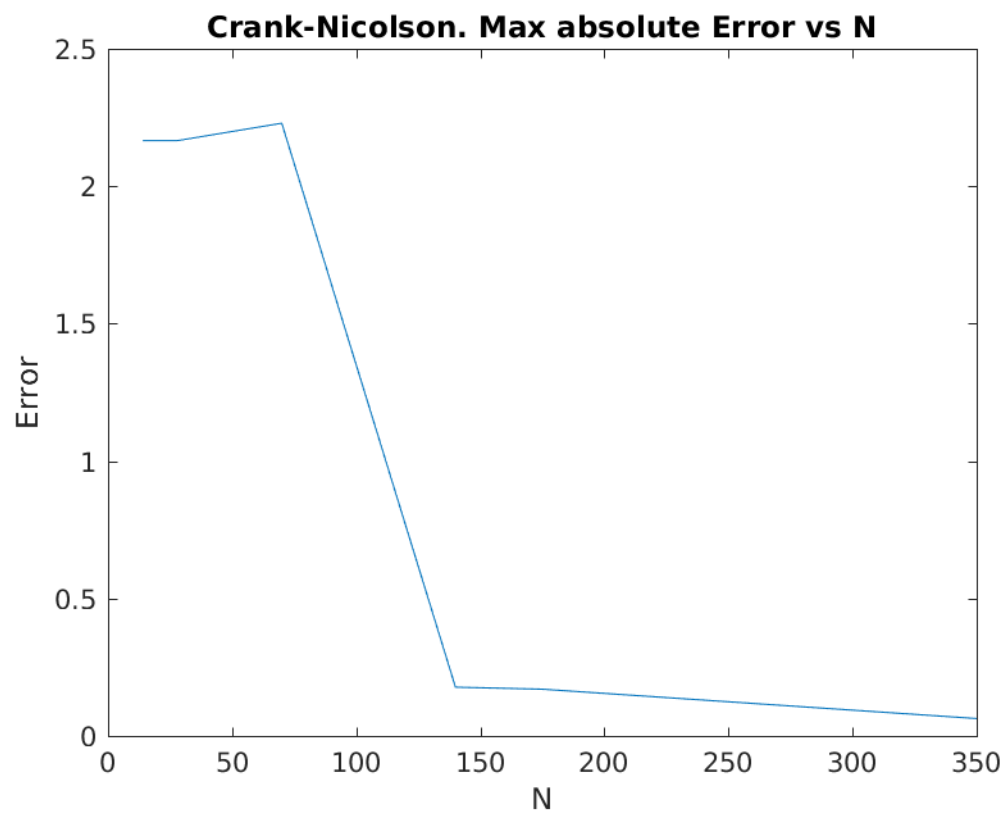
Question 2

Pricing American Put using BTCS and Crank-Nicolson along with PSOR method.
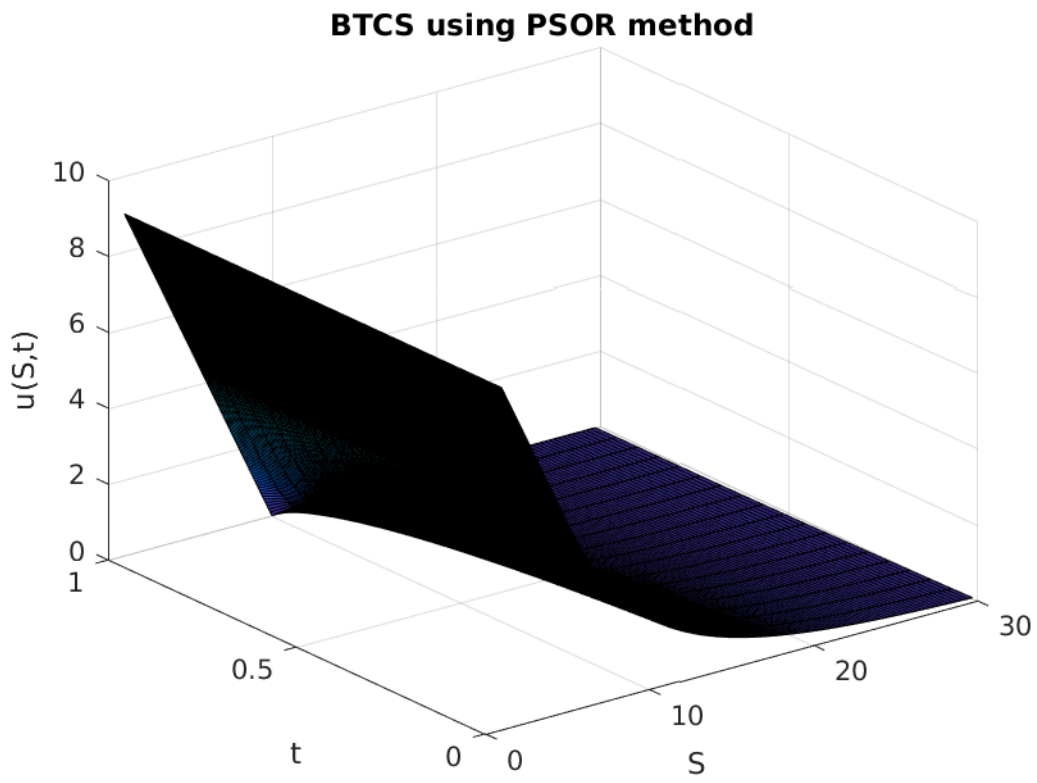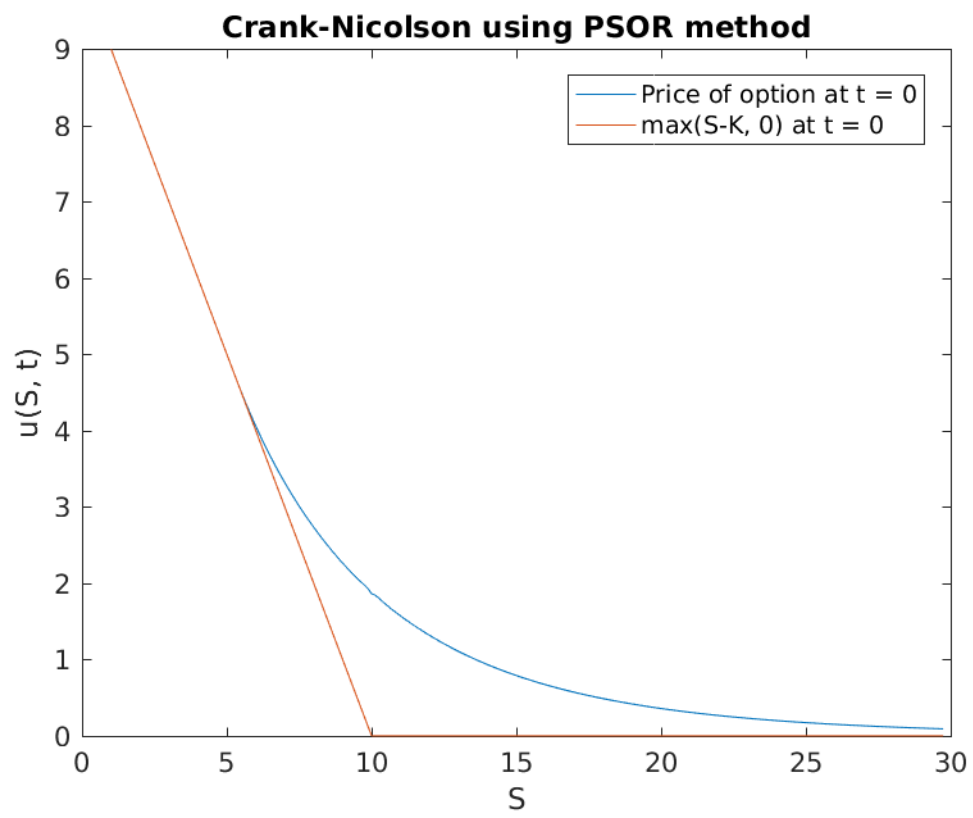
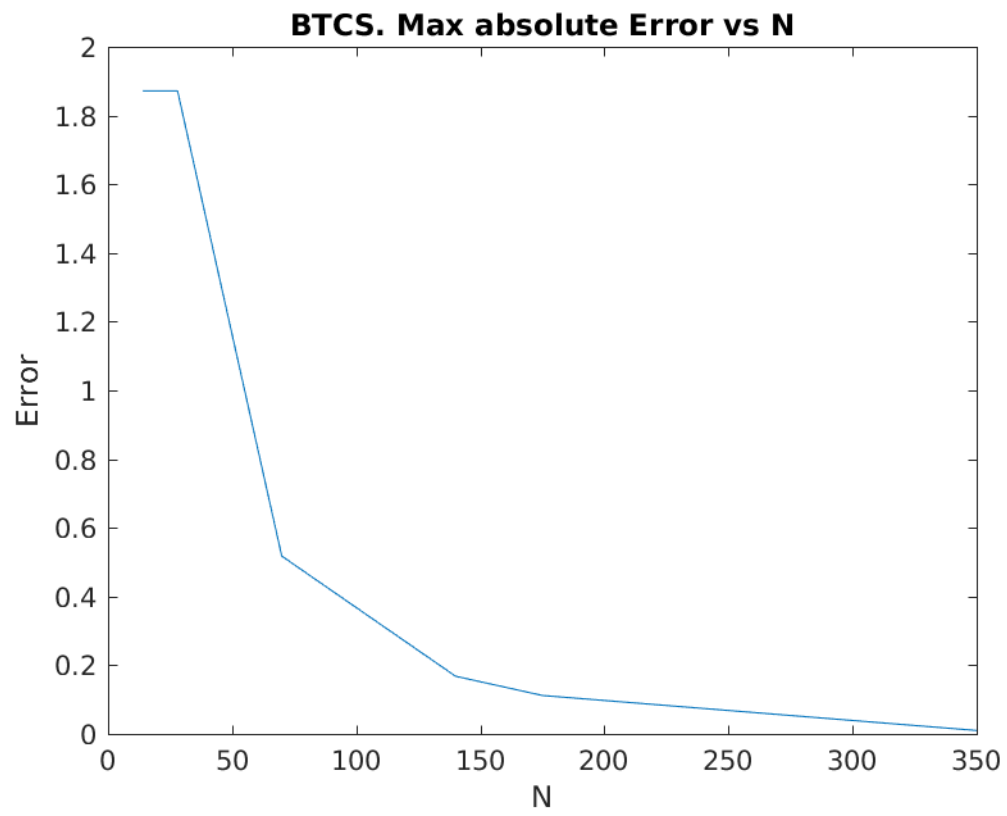BTCS using PSOR method

Crank-Nicolson using PSOR method

Legend:
- Price of option at t = 0
- max(S-K, 0) at t = 0

Crank-Nicolson using PSOR method

BTCS Error in U for (δx and δτ), and (δx/2 and δτ/2) at t = 0

Error in U for (dx and dTau), and (dx/2 and dTau/2) at t = 0

BTCS. Max absolute Error vs N

Crank-Nicolson Error in U for (δx and δτ), and (δx/2 and δτ/2) at t =

Crank-Nicolson. Max absolute Error vs N