

Assignment 16

CS374

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Assigned by :

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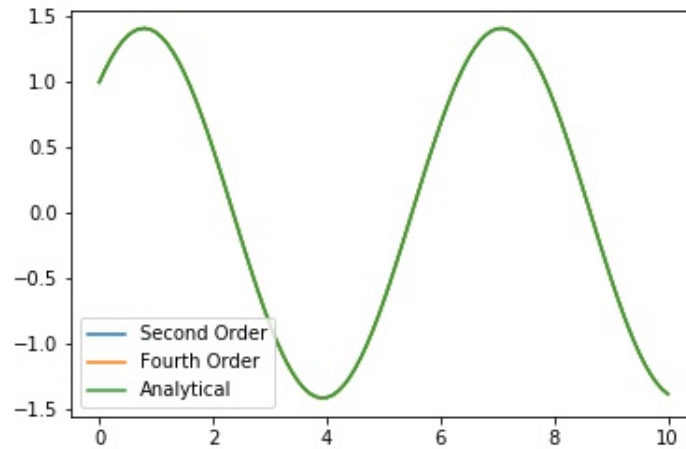
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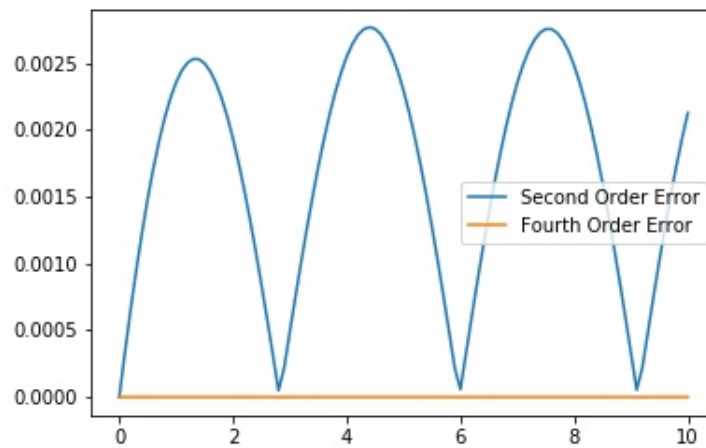
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1 Runge-Kutta method

1.1 $h=0.1$

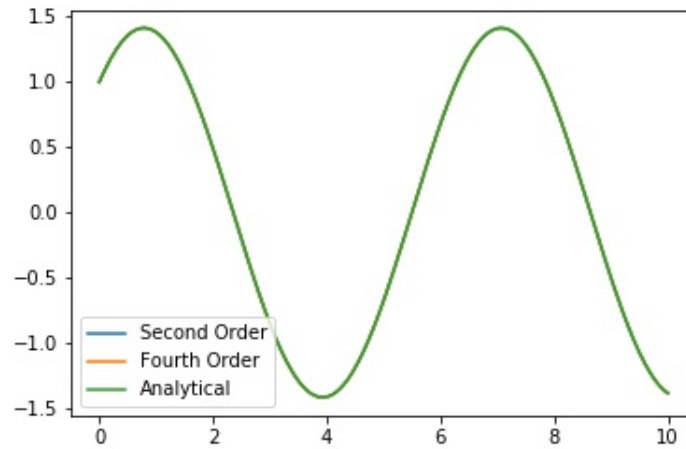


Plot of Second, Fourth Order Curves of Runge-Kutta Method and Analytical plot

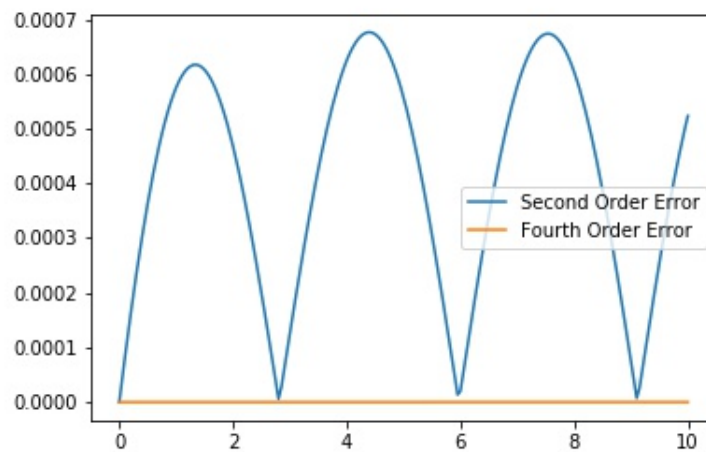


Plot of Error of Second, Fourth Order Curves of Runge-Kutta Method w.r.t Analytical plot

1.2 $h=0.05$



Plot of Second, Fourth Order Curves of Runge-Kutta Method and Analytical plot



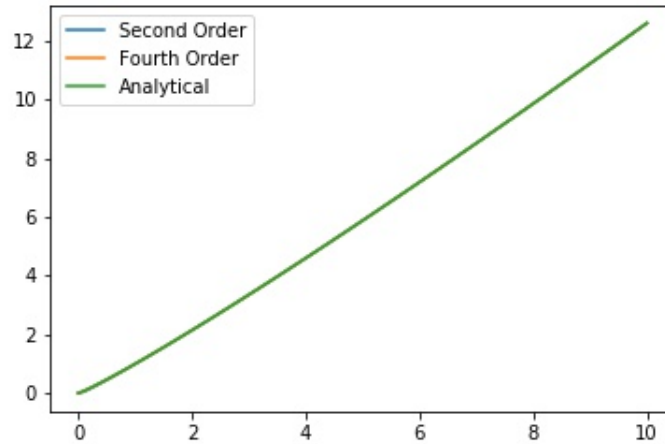
Plot of Error of Second, Fourth Order Curves of Runge-Kutta Method w.r.t
Analytical plot

1.3 Observations

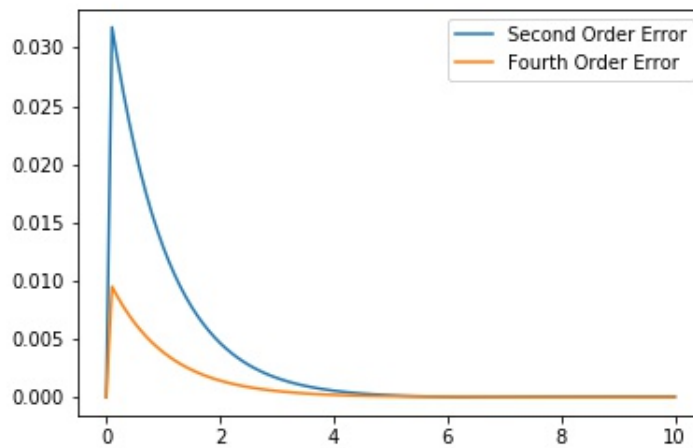
1. On decreasing the value of 'h' the error between the second and fourth order Range-Kutta plots w.r.t true function decreases.
2. Also error between fourth order Range-Kutta and true function is negligible in comparison to second order; being almost zero.

2 Runge-Kutta method

2.1 $h=0.1$

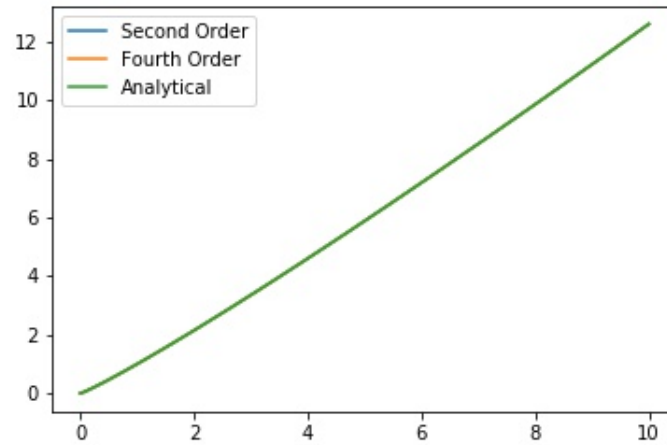


Plot of Second, Fourth Order Curves of Runge-Kutta Method and Analytical plot

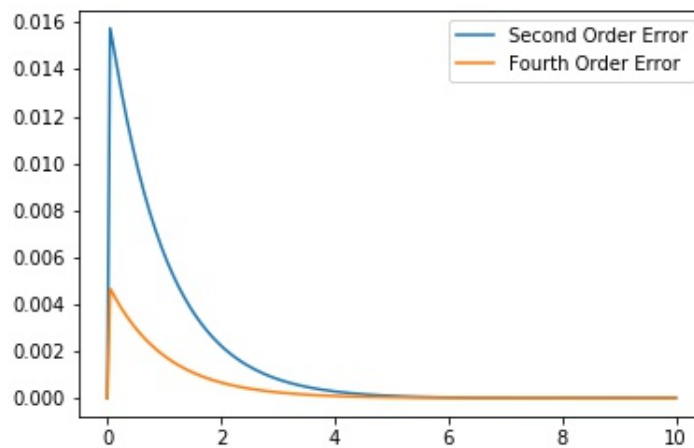


Plot of Error of Second, Fourth Order Curves of Runge-Kutta Method w.r.t
Analytical plot

2.2 $h=0.05$



Plot of Second, Fourth Order Curves of Runge-Kutta Method and Analytical plot

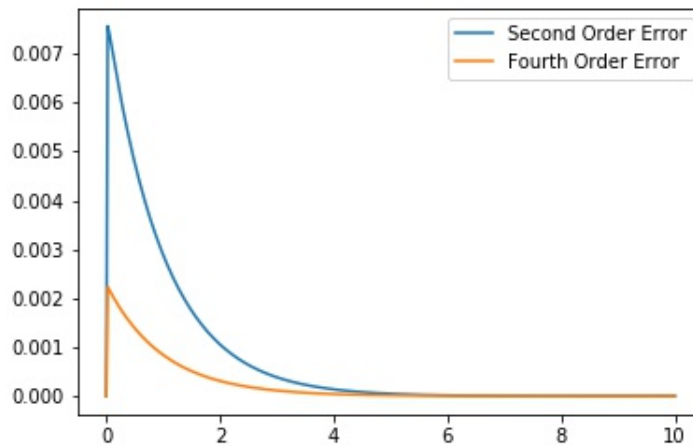


Plot of Error of Second, Fourth Order Curves of Runge-Kutta Method w.r.t
Analytical plot

2.3 $h=0.025$



Plot of Second, Fourth Order Curves of Runge-Kutta Method and Analytical plot

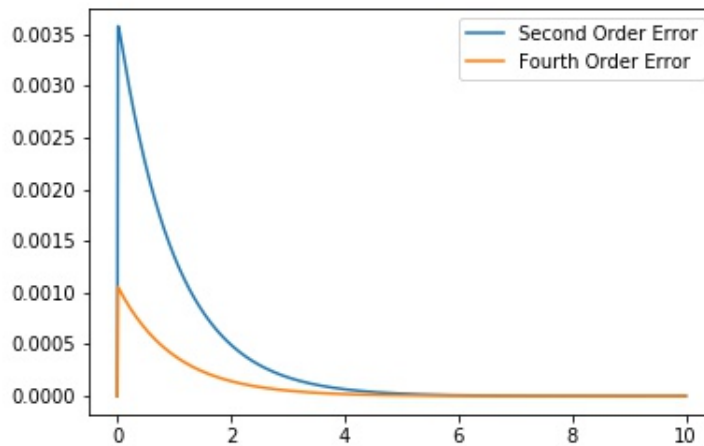


Plot of Error of Second, Fourth Order Curves of Runge-Kutta Method w.r.t
Analytical plot

2.4 $h=0.0125$



Plot of Second, Fourth Order Curves of Runge-Kutta Method and Analytical plot

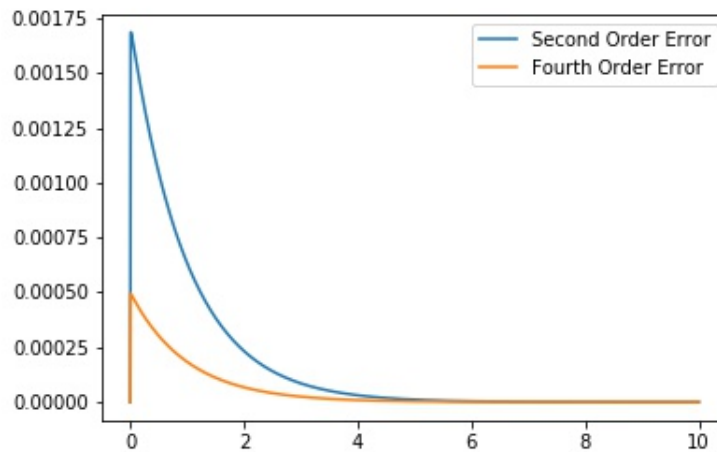


Plot of Error of Second, Fourth Order Curves of Runge-Kutta Method w.r.t
Analytical plot

2.5 $h=0.00625$



Plot of Second, Fourth Order Curves of Runge-Kutta Method and Analytical plot



Plot of Error of Second, Fourth Order Curves of Runge-Kutta Method w.r.t
Analytical plot

2.6 Observations

1. On decreasing the value of 'h' the error between the second and fourth order Range-Kutta plots w.r.t true function decreases.
2. Also error between fourth order Range-Kutta and true function is less than in comparison to second order.