edX MITx CSE.0002x
Introduction to Computational Science and Engineering

Help sandipan_dey ⌄

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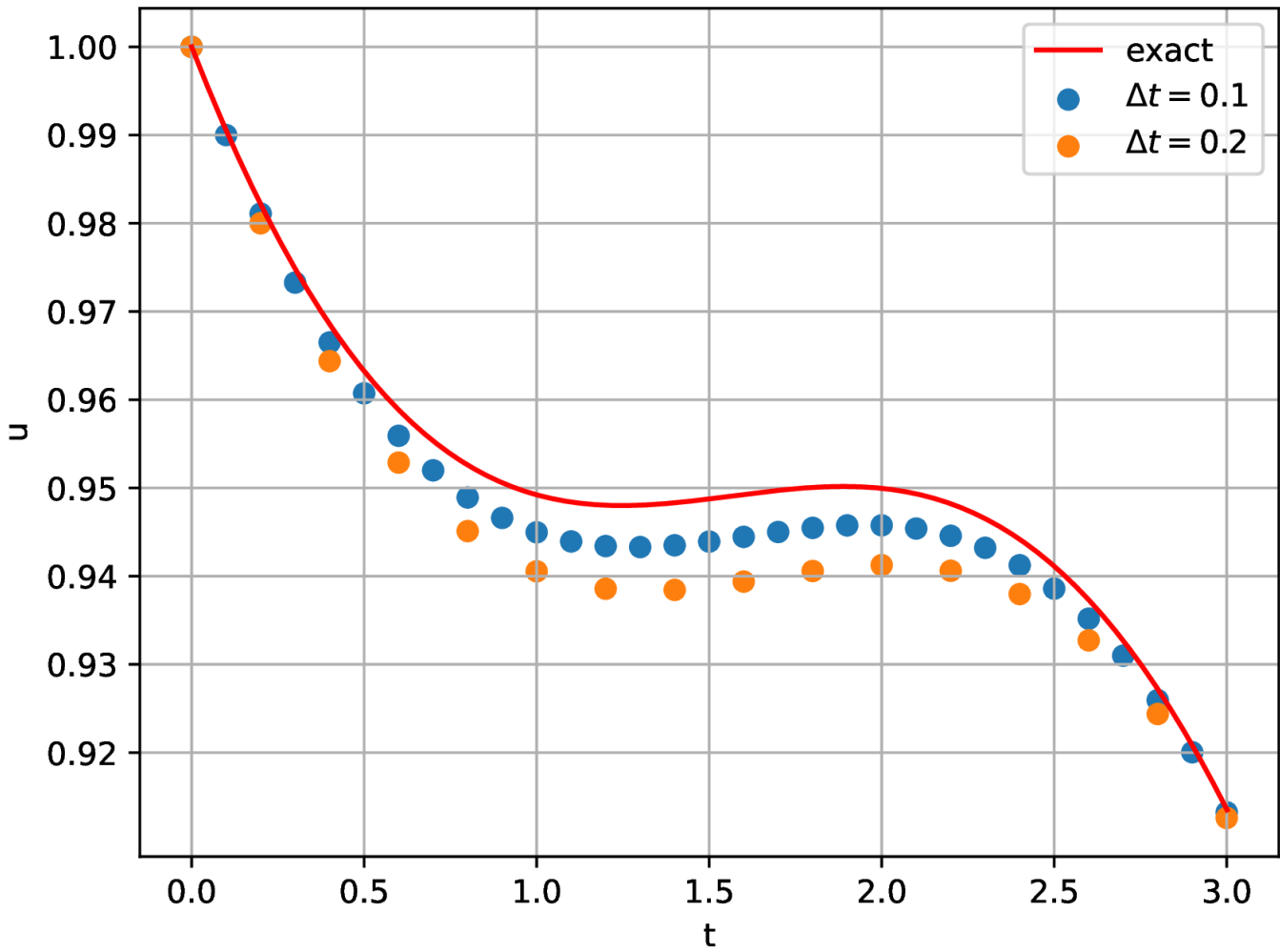
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3.1.8 Finger Exercise: Order of accuracy from solutions with different timesteps

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Finger Exercises 1 due Aug 3, 2023 05:00 IST   Completed

MO2.6

A numerical method is used to solve an Initial Value Problem for the state $u\left(t\right)$ using timesteps of $\Delta t = 0.1$ and 0.2. The results from the numerical method as well as the exact solution are shown in the plot below.

Problem: Error with coarser timestep

1/1 point (graded)

Select the value which approximates the magnitude of the error at $t = 1$ for $\Delta t = 0.2$ in the above plot?

○ 0.005

◉ 0.01

○ 0.94

○ 0.945

○ 0.95

○ None of the above selections satisfactorily approximate the error magnitude

✔

Submit

ↄ Answers are displayed within the problem

Problem: Error with finer timestep

1/1 point (graded)

Select the value which approximates the magnitude of the error at $t = 1$ for $\Delta t = 0.1$ in the above plot?

- ⦿ 0.005
- ◯ 0.01
- ◯ 0.94
- ◯ 0.945
- ◯ 0.95
- ◯ None of the above selections satisfactorily approximate the error magnitude

✔

Solution:

The solution video for this part of the problem is included in video from the first part of the problem.

Submit

ⓘ Answers are displayed within the problem

Problem: Order of accuracy

1/1 point (graded)
What does the order of accuracy appear to be?

- ⦿ p=1
- ◯ p=2
- ◯ p=3

✔

Submit

ⓘ Answers are displayed within the problem

SOLUTION: The solution will be available shortly after the due date in Section 3.2.8.

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