```python
#!/usr/bin/env python3
# -*- coding: utf-8 -*-
"""
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@author: andrewalferman
"""

import numpy as np
import matplotlib.pyplot as plt


# Finds the exact solution using the value found from step 2.a)
def exactsoln(t):
    v = 101.0 / (100.0*np.sin(2.0 * t) - 10.0*np.cos(2.0 * t) +
                 111.0*np.exp(0.2 * t))
    return v


# Create a function that will create all the data for a single stepsize
def fwdeuler(stepsize):
    # Set up the initial conditions and other parameters.
    v = 1.0
    time = 0.0
    maxtime = 7.0
    # Create a few lists to store all of the data
    tlist, vlist, error = [], [], []
    while time <= maxtime:
        tlist.append(time)
        vlist.append(v)
        error.append(np.absolute(v - exactsoln(time)))
        v += (-0.2*v - 2*np.cos(2*time)*v**2) * stepsize
        time += stepsize
    return tlist, vlist, error


# Range of step sizes
steps = [0.2, 0.05, 0.025, 0.006]
erl, erlt = [], []

for i in steps:
    time, vel, error = fwdeuler(i)
    plt.figure(1)
    plt.plot(time, vel, label='Delta t = {}'.format(i))
    plt.figure(2)
    plt.plot(time, error, label='Delta t = {}'.format(i))

# Plot the exact solution
t = 0.0
ev, ets = [], []

while t <= 7.0:
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        ev.append(exactsoln(t))
        ets.append(t)
        t += 0.001

plt.figure(1)
plt.plot(ets, ev, label='Exact Solution')

# Plot the result
plt.figure(1)
plt.xlabel('Time')
plt.ylabel('Velocity')
plt.title('Forward Euler Approximation')
plt.legend(bbox_to_anchor=(1, 1), loc=2)
plt.xlim(0.0, 7.0)
plt.figure(2)
plt.xlabel('Time')
plt.ylabel('Error')
plt.title('Error of Fwd Euler Approximation')
plt.legend(bbox_to_anchor=(1, 1), loc=2)
plt.xlim(0.0, 7.0)
plt.show()
print("As seen in the two graphs above, a step size of delta t = 0.006\
      provides a reasonable approximation for the exact function.  The erro
      is less than 0.05, and the function converges in a stable manner and\
      follows the trend of the exact solution. A smaller grid size may be u
      if greater accuracy of the solution is needed, especially at t ~= 2.5
```