```python
# plasma_simulation_tokamak.py

# Simplified Plasma Temperature Simulation in a Tokamak

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"""

This script demonstrates a simplified numerical model of plasma temperature

evolution in a tokamak reactor.


Model assumption:

The temperature follows a simplified energy loss equation:


    dT/dt = -kT


with analytical solution:


    T(t) = T0 * exp(-k t)


This example illustrates numerical modeling and scientific visualization

relevant to computational physics applications.

"""


import numpy as np

import matplotlib.pyplot as plt


# Time array (0 to 10 seconds)
```

```python
t = np.linspace(0, 10, 500)

# Parameters
T0 = 100        # Initial plasma temperature (arbitrary units)
k = 0.3         # Simplified energy loss coefficient

# Temperature evolution
T = T0 * np.exp(-k * t)

# Plot
plt.figure(figsize=(8,5))
plt.plot(t, T, linewidth=2)
plt.xlabel("Time (s)")
plt.ylabel("Plasma Temperature (a.u.)")
plt.title("Simplified Plasma Temperature Evolution in a Tokamak")
plt.grid(True)
plt.show()
```