

demo_integration

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1 A Simple Script to Integrate Differential Equations

1.1 Function import

```
[3]: from scipy.integrate import solve_ivp
     from matplotlib.pyplot import subplots
```

1.2 Rate Equation Definition

```
[4]: def model(t, variables):
     """Harmonic Oscillator"""

     X, Y = variables

     dXdt = - Y
     dYdt = + X

     return [dXdt, dYdt]
```

1.3 Integrate and Plot Result

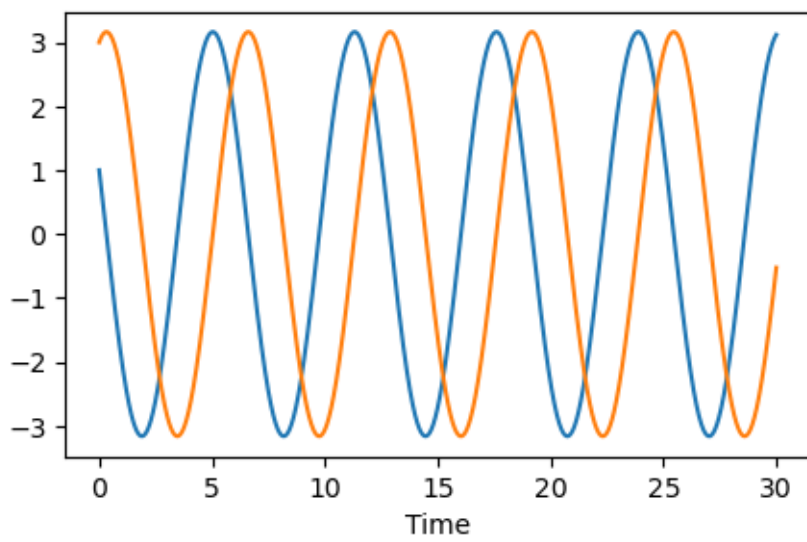
```
[5]: initial_conditions = [1, 2]

     time_span = (0, 30)

     solution = solve_ivp(model, (0, 30), (1, 3), max_step=0.01)

     fig, ax = subplots(figsize=(5, 3))

     ax.plot(solution.t, solution.y.T);
     ax.set_xlabel('Time');
```



[]: