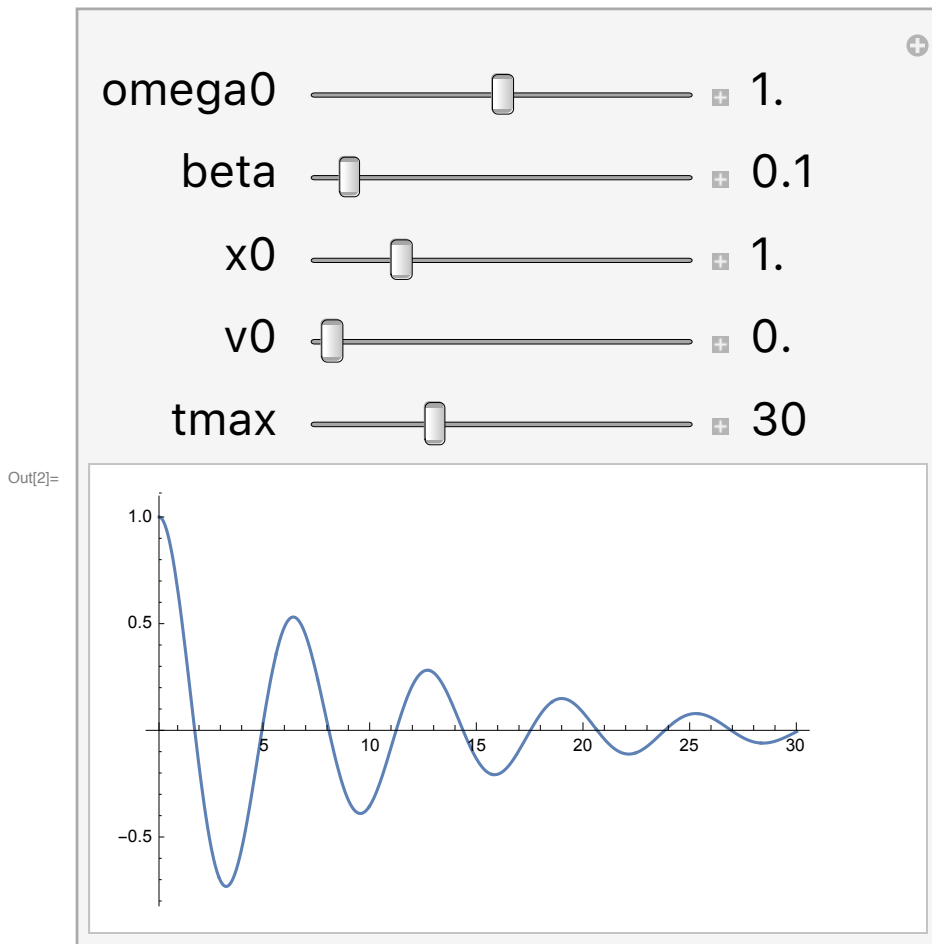


```

In[1]:= ClearAll["Global`*"];
Manipulate[
  soln = NDSolveValue[{x'[t] + 2 beta x'[t] + omega0^2 x[t] == 0,
    x'[0] == v0, x[0] == x0}, x[t], {t, 0, tmax}];
  Plot[soln, {t, 0, tmax}, PlotRange -> All],
  {{omega0, 1.0}, 0, 2.0, Appearance -> "Labeled", LabelStyle -> Large},
  {{beta, 0.1}, 0, 2.0, Appearance -> "Labeled", LabelStyle -> Large},
  {{x0, 1.0}, 0, 5.0, Appearance -> "Labeled", LabelStyle -> Large},
  {{v0, 0.0}, 0.0, 10.0, Appearance -> "Labeled", LabelStyle -> Large},
  {{tmax, 30}, 0, 100, Appearance -> "Labeled", LabelStyle -> Large},
  LabelStyle -> Large]

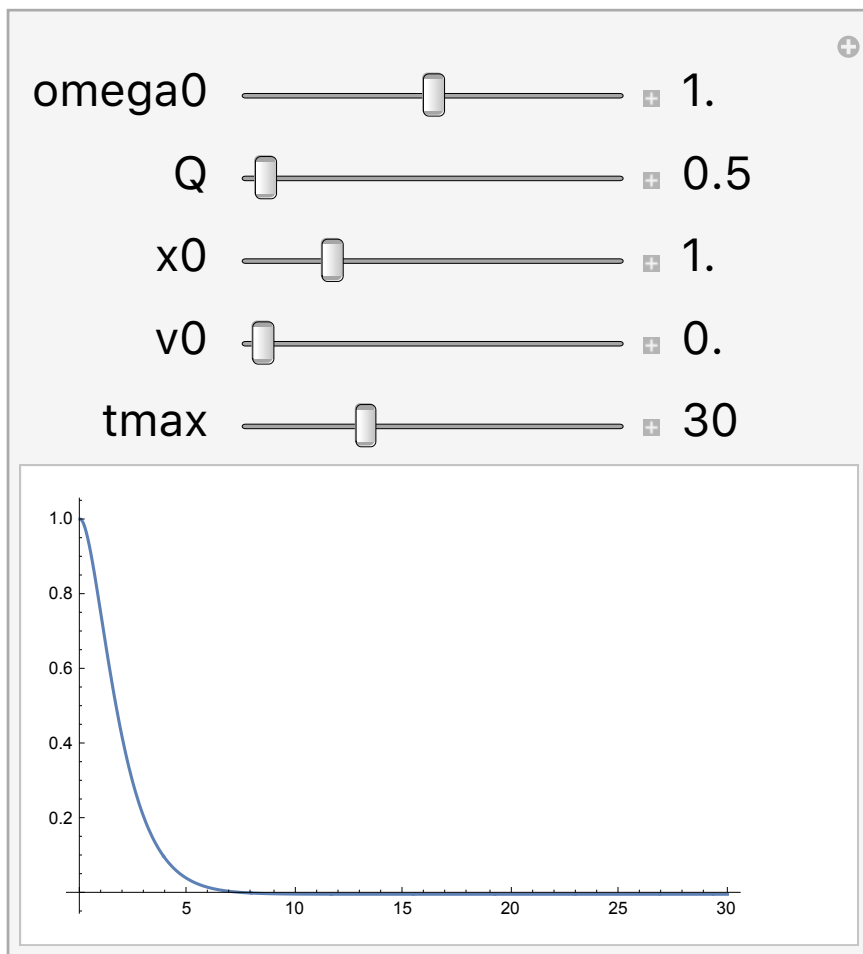
```



```

In[3]:= ClearAll["Global`*"];
Manipulate[
  beta = omega0 / (2 Q);
  soln = NDSolveValue[{x''[t] + 2 beta x'[t] + omega0^2 x[t] == 0,
    x'[0] == v0, x[0] == x0}, x[t], {t, 0, tmax}];
  Plot[soln, {t, 0, tmax}, PlotRange -> All],
  {{omega0, 1.0}, 0, 2.0, Appearance -> "Labeled", LabelStyle -> Large},
  {{Q, 0.5}, 0.01, 100.0, Appearance -> "Labeled", LabelStyle -> Large},
  {{x0, 1.0}, 0, 5.0, Appearance -> "Labeled", LabelStyle -> Large},
  {{v0, 0.0}, 0.0, 10.0, Appearance -> "Labeled", LabelStyle -> Large},
  {{tmax, 30}, 0, 100, Appearance -> "Labeled", LabelStyle -> Large},
  LabelStyle -> Large]

```



Out[4]=

```

In[5]:= ClearAll["Global`*"];
omega0 = 1.0;
Manipulate[
  soln =
    NDSolveValue[{x''[t] + 2 beta x'[t] + omega0^2 x[t] == fampl Cos[omega t + fphi],
      x'[0] == v0, x[0] == x0}, x[t], {t, 0, tmax}];
  Show[
    Plot[{soln, fampl Cos[omega t + fphi]}, {t, 0, tmax}, PlotRange -> All],
    {{omega, 1.0}, 0, 2.0, Appearance -> "Labeled", LabelStyle -> Large},
    {{beta, 0.1}, 0, 2.0, Appearance -> "Labeled", LabelStyle -> Large},
    {{fampl, 1.0}, 0, 2.0, Appearance -> "Labeled", LabelStyle -> Large},
    {{fphi, 0.0}, -Pi, Pi, Appearance -> "Labeled", LabelStyle -> Large},
    {{x0, 0.0}, -5.0, 5.0, Appearance -> "Labeled", LabelStyle -> Large},
    {{v0, 0.0}, 0.0, 10.0, Appearance -> "Labeled", LabelStyle -> Large},
    {{tmax, 100}, 0, 1000, Appearance -> "Labeled", LabelStyle -> Large},
    LabelStyle -> Large]

```

Out[7]=

