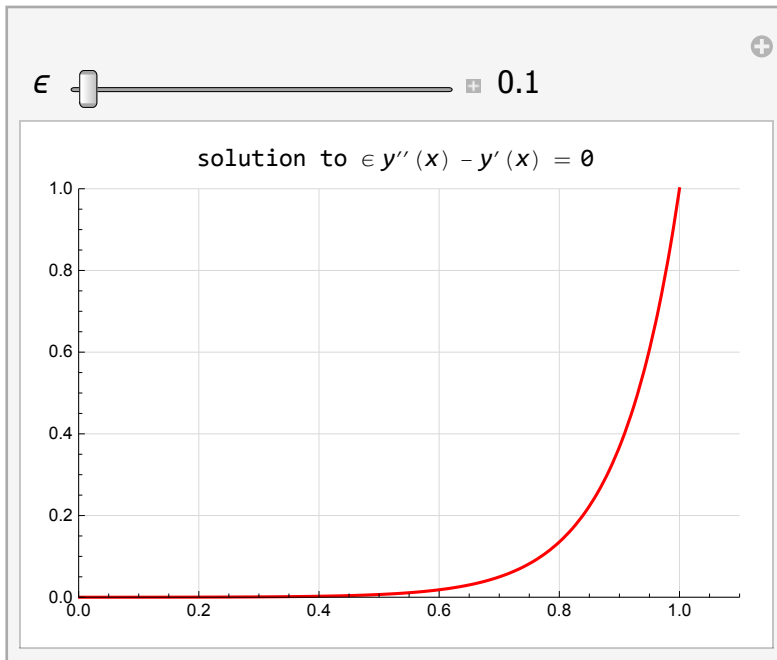These are small animations of the solutions to the 2 ODE's from lecture 2/9/17 for the small parameter.
Nasser M. Abbasi
2/20/2017, EP 548, Univ. Wisconsin Madison.

```
Manipulate[
 Labeled[
  Plot[ (-1 + e^(x/z)) / (-1 + e^(1/z)) , {x, 0, 2}, PlotRange → {{0, 1.1}, {0, 1}},
   GridLines → Automatic, GridLinesStyle → LightGray, PlotStyle → Red],
  Row[{"solution to ", TraditionalForm[ε y''[x] - y'[x] == 0]}], Top],
  {{z, 0.1, "ε"}, .1, 0.001, -0.001, Appearance → "Labeled"}
]
```


For eps*y''+y=0 ode, we notice global variations showing up in frequency as well as in amplitude as eps become very small

```
Manipulate[
 Labeled[
      Plot[ Sin[ x/√z ] / Sin[ 1/√z ] , {x, 0, 2}, PlotRange → {{0, 2}, {-10, 10}},
   GridLines → Automatic, GridLinesStyle → LightGray, PlotStyle → Red],
   Style[Row[{"solution to ", TraditionalForm[z y''[x] + y[x] == 0]}], 16], Top],
  {{z, 0.01, "ϵ"}, 0.01, 0.0001, -0.0001}
 ]
```

ϵ

solution to $0.01\, y''(x) + y(x) = 0$