

Tutorial 6: Interpolation in *Mathematica*

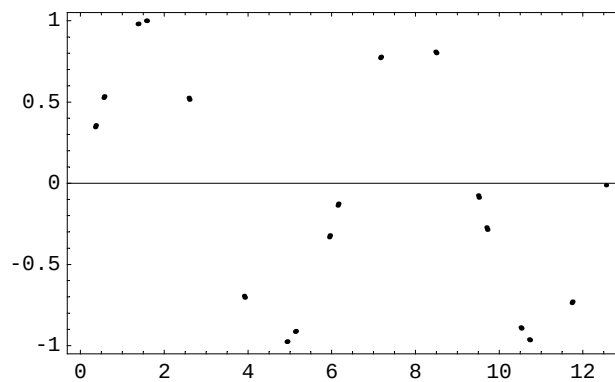
```
Off[General::spell];
```

Version 1, BRW, 8/1/07

Mathematica has a nice command that will create an interpolation function of any set of data in an ordered pair. This interpolation function can be treated like any normal function. First, let's generate a set of data

```
data = Table[{i 0.01  $\frac{2\pi}{5}$ , Sin[i 0.01  $\frac{2\pi}{5}$ ]}, {i, 0, 999, 1}];
```

```
ListPlot[data, Frame → True];
```

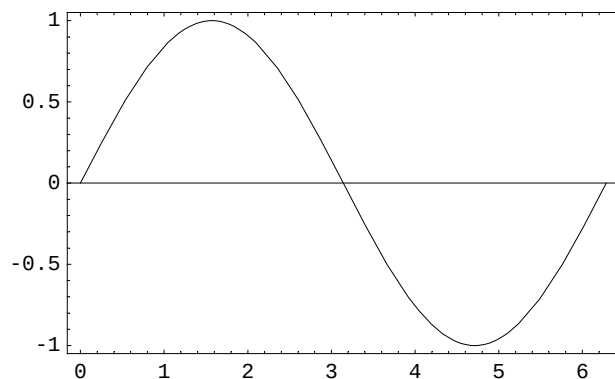


The data is a list of ordered pairs. Now let's interpolate this data as a function of time

```
f[t_] = Interpolation[data][t]
```

```
InterpolatingFunction[{{0., 12.5538}}, <>][t]
```

```
Plot[f[t], {t, 0, 2 π}, Frame → True];
```



We can treat this function like any other function, let's find its derivative.

```
df[t_] = f'[t]
```

```
InterpolatingFunction[{{0., 12.5538}}, <>][t]
```

```
Plot[df[t], {t, 0, 2  $\pi$ }, Frame  $\rightarrow$  True];
```

