Statistics 581, Chapter 2

Empirical Distribution Function and Empirical Process Figures

Wellner; 10/31/2001

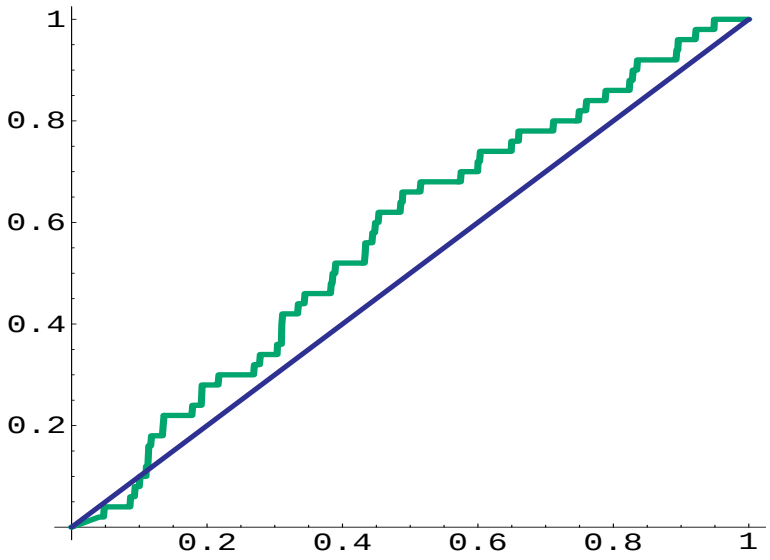

Figure 1: Uniform Empirical Distribution Function, $n = 50$.

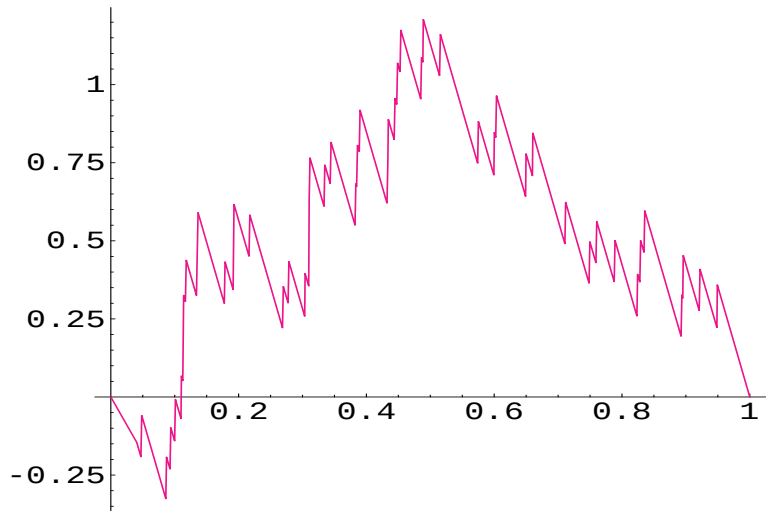

Figure 2: Uniform Empirical Process, $n = 50$.

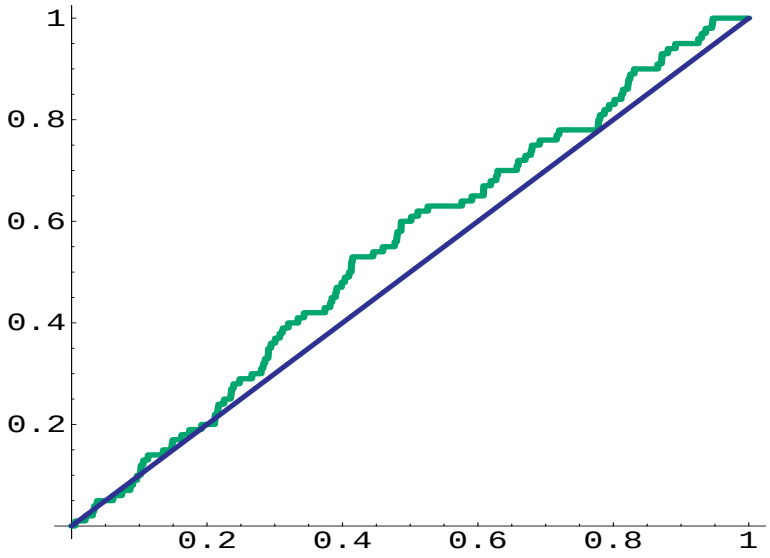

Figure 3: Uniform Empirical Distribution Function, $n = 100$.

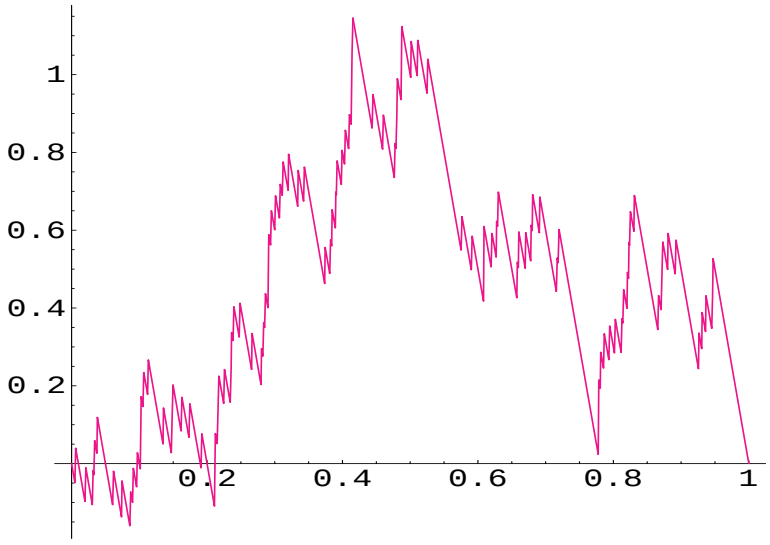

Figure 4: Uniform Empirical Process, $n = 100$.

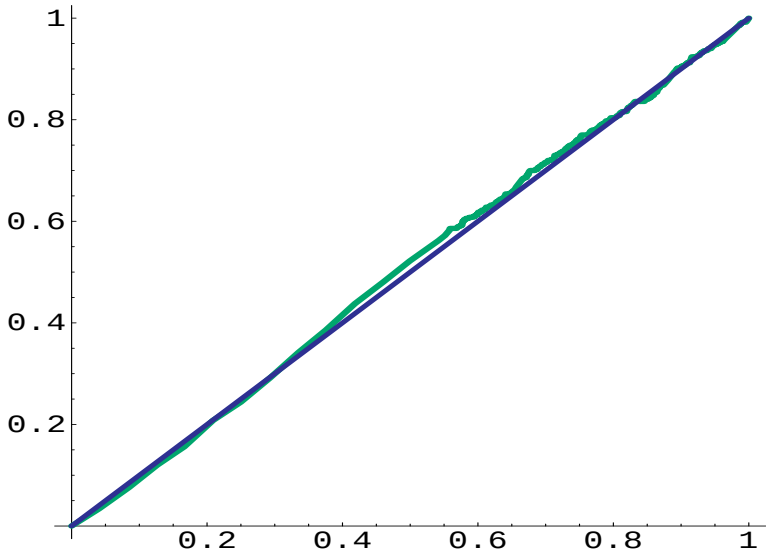

Figure 5: Uniform Empirical Distribution Function, $n = 500$.

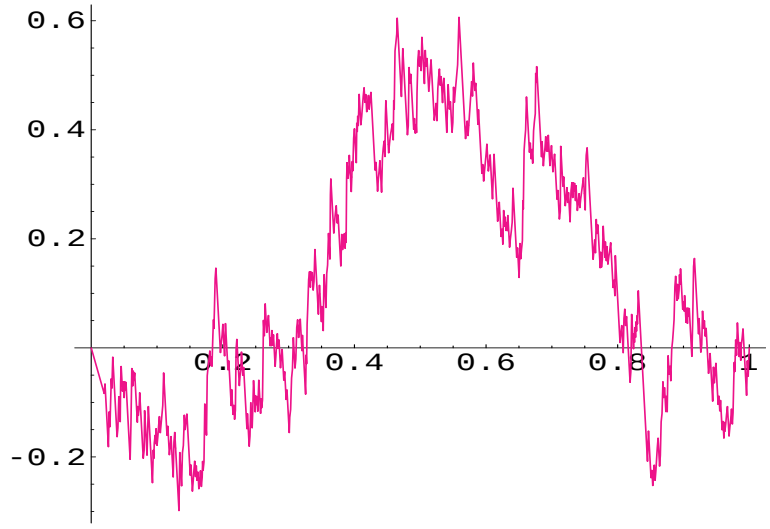

Figure 6: Uniform Empirical Process, $n = 500$.

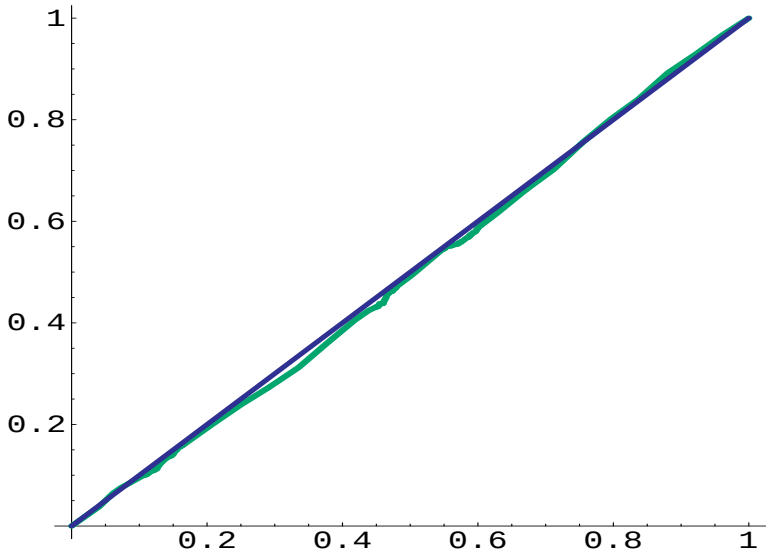

Figure 7: Uniform Empirical Distribution Function, $n = 1000$.

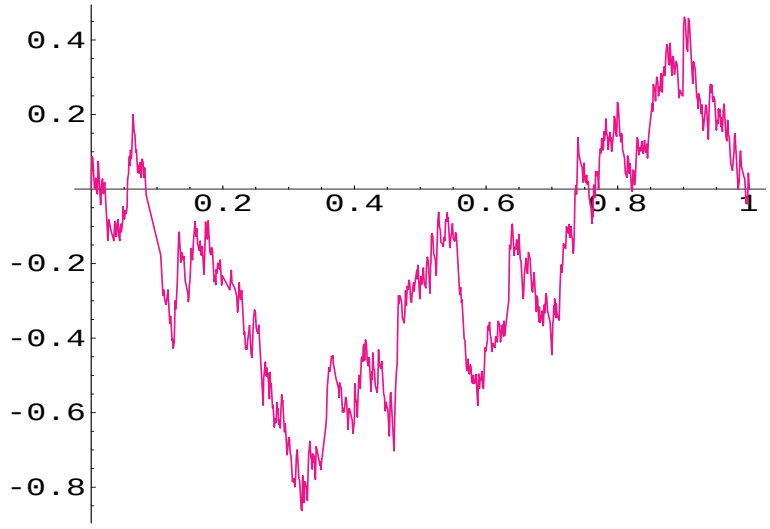

Figure 8: Uniform Empirical Process, $n = 1000$.

Mathematica Code for Figures 1-8:

```
n = 50
x = Table[Random[ ], {n}]
yy = Sort[x]
zz = Table[k , {k,1,n}]*(1/n)  //N
Table[{yy[[i]],zz[[i]]}, {i,1,n}]
Delta[x_] := 0 /;  x < 0
```

```
Delta[x_] := 1 /;  x >= 0
DE[x_] := Table[{Delta[yy[[i]] - x]}, {i,1,n}]
EDF[n_, x_] := 1. - Apply[Plus,DE[x]]*(1/n)  //N
Funif[x_] := x
EMP[n_, x_] := Sqrt[n]*(EDF[n,x] - Funif[x])
Plot[{EDF[n,x], Funif[x]}, {x,0,1},
    PlotStyle -> {
     {Thickness[1/100],RGBColor[0.000, 1.000, 0.196],Dashing[{}]},
     {Thickness[1/120],RGBColor[0,0,1],Dashing[{}]}
    }, AspectRatio->1.0
    ]
Plot[EMP[n,x], {x,0,1},
PlotStyle ->
RGBColor[1.000, 0.032, 0.948],
AspectRatio->1.0
]
```