```
Manipulate[
 (*Nasser M. Abbasi, June 20, 2014*)
 (*the signal is cosine, and the SNR is given as ratio of variances*)
 Module[{nPoints, x0, varx0, n, x, del},
  nPoints = 128;
  del = 4 Pi / (nPoints - 1);
  x0 = Cos[Range[0, 4 * Pi, del]];
  varx0 = Variance[x0];
  SeedRandom[0];
  n = RandomVariate[NormalDistribution[0, 1], nPoints];
  x = x0 + Sqrt[varx0 / snr] * n;
  Show[ListLinePlot[x0, PlotStyle → Blue],
   ListLinePlot[x, PlotStyle → Red], PlotRange → {{0, Round[xmax / del]}, {-ymax, ymax}},
   ImagePadding → {{40, 15}, {40, 40}}, Frame → True, ImageSize → 400,
   FrameLabel → {{"y(t)", None}, {"time", "Adding noise to signal"}}, Axes → None]
  ],
 Grid[{
   {"SNR",
    Manipulator[Dynamic[snr, {snr = #} &], {1, 999, 1}, ImageSize → Tiny],
    Dynamic@Row[{NumberForm[snr, 3], " (", NumberForm[10. Log[10, snr], 4], " db)"}]
    },
   {"x max",
    Manipulator[Dynamic[xmax, {xmax = #} &], {.1, 4. * Pi, .1}, ImageSize → Tiny],
    Dynamic[xmax]
    },
   {"y max",
    Manipulator[Dynamic[ymax, {ymax = #} &], {.1, 1.4, .1}, ImageSize → Tiny],
    Dynamic[ymax]
    }
   }, Alignment → Left
  ],
 {{snr, 50}, None},
 {{xmax, 4. * Pi}, None},
 {{ymax, 1.4}, None}
 ]
```

SNR　🔲───── ⊞ 50 (16.99 db)

x max　────🔲 ⊞ 12.5664

y max　────🔲 ⊞ 1.4

Out[1]=

Adding noise to signal