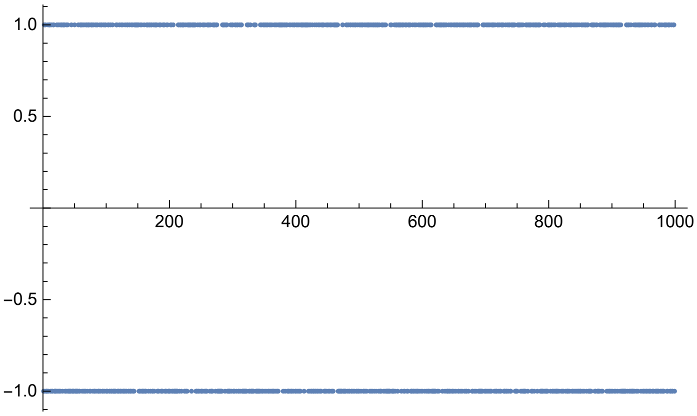
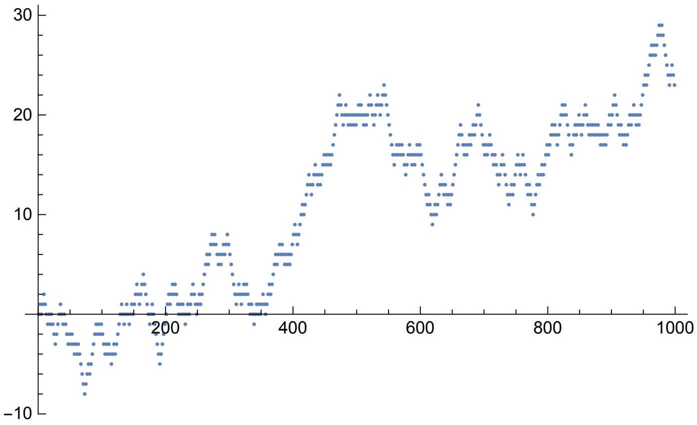
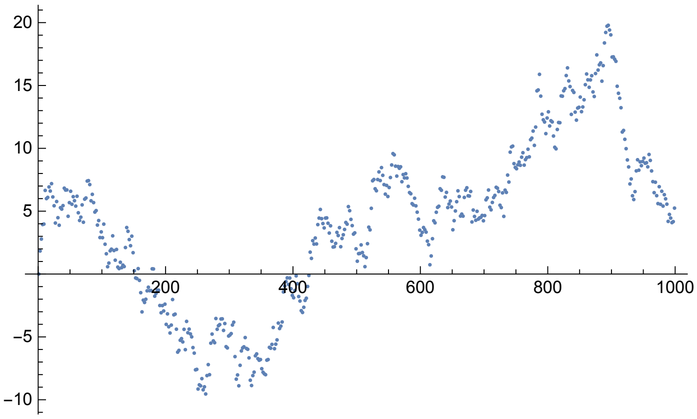
```
(* we build our own stochastic process *)
(* (a) sequence of independent ups and downs *)
(* (b) sequence of independent, discrete steps up and down *)
(* (c) sequence of independent, normal distributed steps up and down *)
(* (d) sequence of normal distributed steps up and down,
variance depending on mean of last two steps *)
NN = 1000;
(* do (a) *)
sum1 = {};
For[j = 1, j ≤ NN - 1, j++, AppendTo[sum1, 2 * (RandomInteger[{1, 2}] - 1.5)]];
ListPlot[sum1]
```



```
(* do (b) *)
sum1 = {0};
For[j = 1, j ≤ NN - 1, j++,
  AppendTo[sum1, sum1[[j - 1]] + 2 * (RandomInteger[{1, 2}] - 1.5)]];
ListPlot[
 sum1]
```

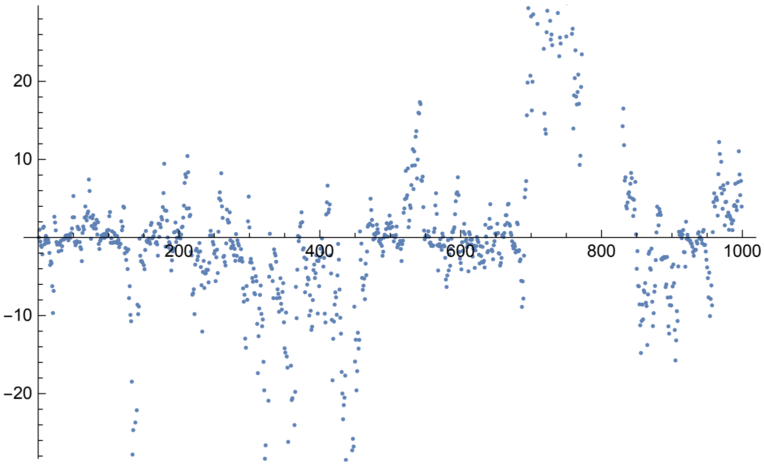


```
(* do (c) *)
sum1 = {0};
For[j = 1, j ≤ NN - 1, j++,
  AppendTo[sum1, sum1[[j - 1]] + RandomVariate[NormalDistribution[0, 1.0], 1][[1]] ]
 ];
ListPlot[sum1]
```

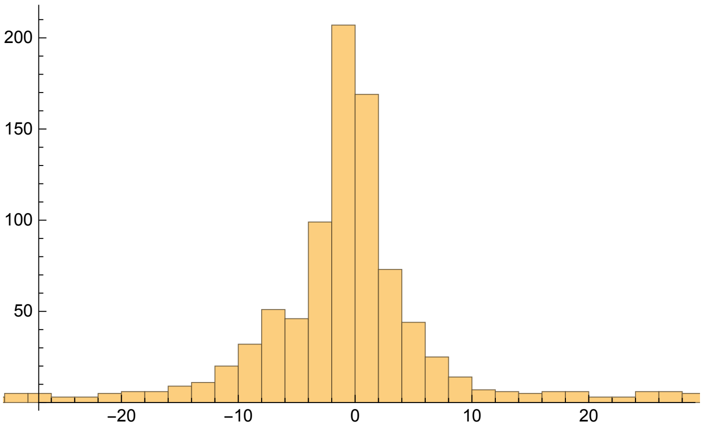


```
(* do (d) *)
sum1 = {0, 1};
NN = 1000
For[j = 3, j ≤ NN - 1, j++, AppendTo[sum1, sum1[[j - 1]] + RandomVariate[
      NormalDistribution[0, Sqrt[Abs[(sum1[[j - 1]] + sum1[[j - 2]])]]], 1][[1]] ]
 ];
ListPlot[sum1]
```

```
1000
```



```
Histogram[sum1]
```



```
(* check if values are normally distributed *)
(* see: http://reference.wolfram.com/language/ref/DistributionFitTest.html *)
U = DistributionFitTest[sum1, Automatic, "HypothesisTestData"];
U["TestDataTable", All]
```

	Statistic	P-Value
Anderson-Darling	102.295	0.
Baringhaus-Henze	176.325	0.
Cramér-von Mises	21.0155	0.
Jarque-Bera ALM	3074.25	0.
Kolmogorov-Smirnov	0.269979	0.
Kuiper	0.421993	0.
Mardia Combined	3074.25	0.
Mardia Kurtosis	47.4804	$4.918248278933914 \times 10^{-492}$
Mardia Skewness	777.368	4.49417×10^{-171}
Pearson χ^2	1681.66	$9.08423035976677 \times 10^{-337}$
Shapiro-Wilk	0.733261	3.37292×10^{-37}
Watson U^2	19.4982	0.