

Stochastic immigration-emigration process

```
In[1]:= << "ErrorBarPlots`"; << "PlotLegends`"
```

```
In[20]:= << Statistics`DescriptiveStatistics`
```

General::obspkg :

Statistics`DescriptiveStatistics`はサポートされなくなりました。ロードしようとしているレガシーバージョンは、現在のMathematica機能と衝突を起す可能性があります。更新情報についてはCompatibility Guideをご覧ください。 >>

Simulation by C

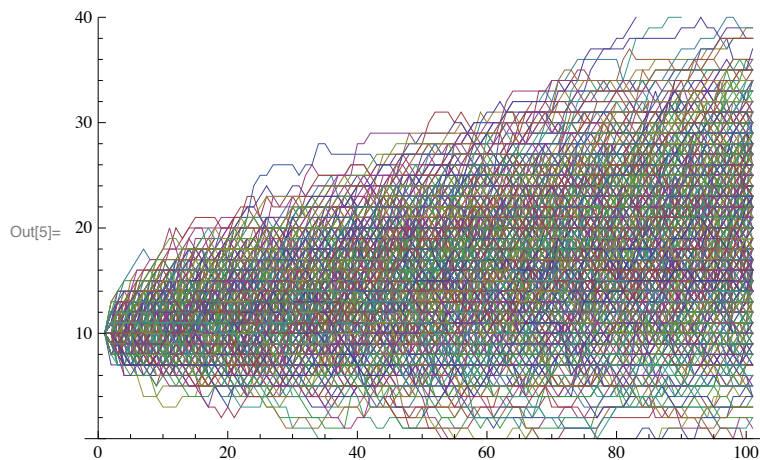
```
In[2]:= SetDirectory["/Users/takasu/home/情報科学科の仕事/講義/平成23年度/H23 大学院講義/Immig
```

```
Out[2]:= /Users/takasu/home/情報科学科の仕事/講義/平成23年度/H23  
大学院講義/Immigration model/immigration-migration/build/Development
```

```
In[3]:= data = ReadList["data", Real, RecordLists->True];  
len = Length[data]
```

```
Out[4]:= 1000
```

```
In[5]:= gSimulation = ListPlot[data, Joined -> True, PlotRange -> {0, 40}]
```



```
In[7]:= dataT = Transpose[data];
```

```
In[8]:= averageDyna = Map[ Mean, dataT]
```

```
Out[8]:= {10., 10.135, 10.194, 10.276, 10.373, 10.47, 10.583, 10.703, 10.834,
  10.931, 11.052, 11.143, 11.229, 11.346, 11.465, 11.584, 11.686,
  11.762, 11.805, 11.904, 11.979, 12.017, 12.121, 12.229, 12.356,
  12.457, 12.578, 12.651, 12.759, 12.866, 12.942, 13.024, 13.116,
  13.23, 13.337, 13.46, 13.577, 13.682, 13.783, 13.891, 13.996, 14.097,
  14.221, 14.383, 14.485, 14.549, 14.638, 14.749, 14.826, 14.913,
  14.959, 15.027, 15.12, 15.215, 15.304, 15.387, 15.502, 15.592,
  15.678, 15.791, 15.876, 15.975, 16.096, 16.227, 16.269, 16.331,
  16.43, 16.517, 16.652, 16.79, 16.882, 16.979, 17.07, 17.181, 17.297,
  17.364, 17.434, 17.525, 17.618, 17.665, 17.72, 17.797, 17.942, 18.022,
  18.108, 18.222, 18.336, 18.472, 18.555, 18.65, 18.758, 18.863, 18.957,
  19.073, 19.168, 19.315, 19.387, 19.512, 19.632, 19.721, 19.833}
```

```
In[9]:= Fit[ averageDyna, {1, t}, t]
```

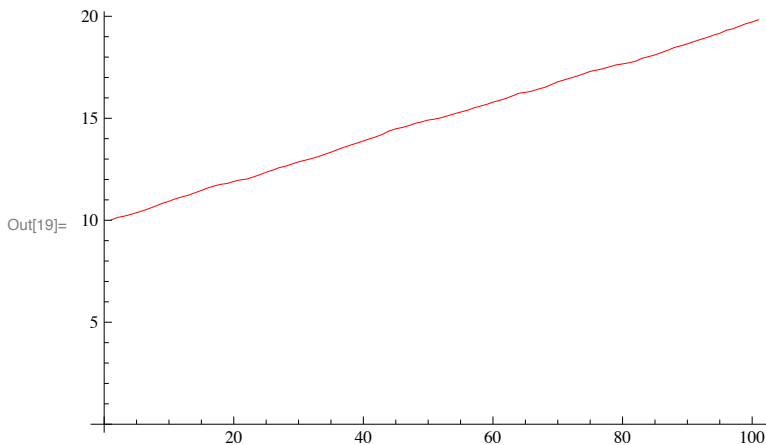
```
Out[9]:= 9.9634 + 0.0970451 t
```

互換性の問題

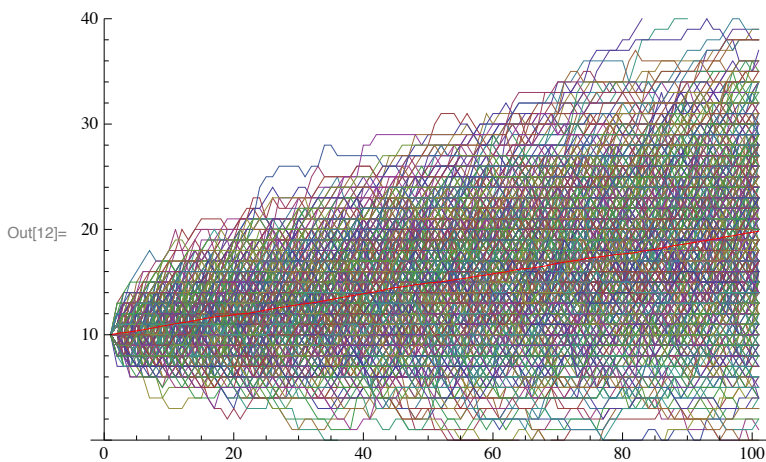
バージョン6で, PlotJoinedはJoinedに代りました. >>

```
In[19]:= gAverage =
```

```
ListPlot[averageDyna, Joined → True, PlotStyle → RGBColor[1, 0, 0]]
```



```
In[12]:= Show[gSimulation, gAverage]
```



In[16]:= **varianceDyna = Map[VarianceMLE, dataT]**

Out[16]= {0., 0.552775, 1.00836, 1.55982, 2.06787, 2.6491, 3.20711, 3.55079,
4.08444, 4.64624, 4.9273, 5.45455, 5.85056, 6.31628, 6.68677, 7.14694,
7.8214, 8.17936, 8.56697, 9.27278, 9.88656, 10.3947, 11.0024, 11.1986,
11.4453, 12.1342, 12.5799, 13.0072, 13.0829, 13.56, 13.7326, 14.2934,
14.9045, 15.3771, 15.8614, 16.1964, 16.5701, 16.9829, 17.5219,
18.0051, 18.72, 19.0116, 19.4922, 20.1283, 20.7198, 21.4816, 21.933,
22.528, 22.8717, 23.4014, 24.3693, 24.7163, 25.4976, 26.0668, 26.6916,
26.9532, 27.482, 28.3315, 28.7503, 28.9533, 29.1686, 29.8804, 30.5308,
31.1555, 31.7566, 32.3934, 32.5751, 33.0617, 33.1949, 33.5659, 34.3821,
35.2826, 36.3671, 36.7762, 37.6188, 38.3335, 38.8416, 38.9894, 39.1021,
39.0808, 39.2916, 39.8658, 40.2266, 40.9075, 41.5203, 42.5607,
43.1171, 43.7292, 44.415, 44.7775, 45.5174, 45.9322, 46.5232, 46.5537,
46.9238, 47.1738, 47.4992, 47.6359, 48.3006, 48.5612, 49.1551}

In[17]:= **Fit[varianceDyna, {1, t}, t]**

Out[17]= $-1.03297 + 0.502031 t$

In[18]:= **ListPlot[varianceDyna, Joined → True]**

