<table>
<thead>
<tr>
<th>項目</th>
<th>内容</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>大学院 生態情報学特論（2015 前期）</td>
</tr>
<tr>
<td>Author</td>
<td>高須 夫悟</td>
</tr>
<tr>
<td>Citation</td>
<td>2015 大学院 生態情報学特論 （2015 前期）</td>
</tr>
<tr>
<td>Issue Date</td>
<td>2016-03-08</td>
</tr>
<tr>
<td>URL</td>
<td><a href="http://hdl.handle.net/10935/4187">http://hdl.handle.net/10935/4187</a></td>
</tr>
<tr>
<td>Textversion</td>
<td>publisher Nara Women’s University Digital Information Repository</td>
</tr>
</tbody>
</table>

このデータは下記の文書を元に作成されたものです。

http://nwudir.lib.nara-w.ac.jp/dspace
一様乱数（メルセンヌツイスタ）

```mathematica
In[77]:= SetDirectory[
    "~/Users/takasu/home/情報科学科の仕事/講義/平成26年度/H26 大学院講義/Generating random numbers/rvs/DerivedData/rvs/Build/Products/Debug/"
]

Out[77]= /Users/takasu/home/情報科学科の仕事/講義/平成26年度/H26

In[78]:= data = ReadList["uniform.out", Real];
   len = Length[data]
   maxdata = Max[data]

Out[79]= 100000
Out[80]= 0.999972

In[81]:= Histogram[data, (0, 1, 0.05), "PDF"]
```

```mathematica
In[82]:= mean = Apply[Plus, data] / len

Out[82]= 0.500874

In[83]:= Apply[Plus, (data - mean)^2] / len

Out[83]= 0.0831453
```

一様乱数 (Mathematica)

```mathematica
In[84]:= Random[]

Out[84]= 0.616362

In[85]:= Table[Random[], (10)]

Out[85]= {0.340182, 0.486816, 0.347294, 0.63905, 0.271129, 0.93767, 0.730877, 0.000725689, 0.535239, 0.407441}

In[86]:= data = Table[Random[], (100000)];
```
In[87]:= Histogram[data, {0, 1, 0.05}, "PDF"]

Out[87]=

In[88]:= Random[Real, {1, 3}]
Out[88]= 2.37868

In[89]:= Table[Random[Real, {1, 3}], {10}]
Out[89]= {2.37721, 2.12515, 2.78299, 2.32511, 1.75352, 2.24504, 2.31317, 1.48853, 1.92003, 1.29328}

In[90]:= data = Table[Random[Real, {1, 3}], {10000}];

In[91]:= Histogram[data, 50, "PDF", PlotRange -> {0, 5}, All], AxesOrigin -> {0, 0}]

Out[91]=

Out[92]=

指数乱数（メルセンヌツイスタ）

In[92]:= data = ReadList["exp.out", Real];
len = Length[data]
maxdata = Max[data]

Out[93]= 100000

Out[94]= 9.84422
In[95] := Histogram[data, 50, "PDF"]

mean = Apply[Plus, data] / len

Out[96] = 0.996328

Out[97] = 0.992622

指数乱数 (Mathematica)

In[98] := data = Table[Random[], {100000}];

In[104] := data2 = -Log[data] / 0.5;

In[105] := Min[data2]

Max[data2]

Out[105] := 0.00000111478


In[107] := ghist = Histogram[data2, 100, "PDF"]
In[110]:= g = Plot[
\text{gamma} \cdot \text{Exp}[-\text{gamma} \cdot \text{x}] /. \text{gamma} \rightarrow 0.5,
\{\text{x}, 0, 20\}, \text{PlotStyle} \rightarrow \text{RGBColor}[1, 0, 0], \text{PlotRange} \rightarrow \text{All}\]

正規分布乱数（メルセンヌツイスタ）

In[111]:= Show[ghist, g]

In[112]:= data = \text{ReadList["gauss.out", Real]};
len = \text{Length[data]}
maxdata = \text{Max[data]}

In[115]:= \text{Histogram[data, 50, "PDF"]}
\begin{align*}
\text{In}[16] &= \text{mean} = \text{Apply}[\text{Plus}, \text{data}] / \text{len} \\
\text{Out}[16] &= 0.00179643 \\
\text{In}[17] &= \text{Apply}[\text{Plus}, (\text{data} - \text{mean})^2] / \text{len} \\
\text{Out}[17] &= 1.0035
\end{align*}

正規分布乱数 (Mathematica)

\begin{align*}
\text{In}[18] &= \text{data} = \text{Table}[\text{Random}[\text{NormalDistribution}[0, 1]], \{100000\}] \\
\text{In}[19] &= \text{Min}[\text{data}] \\
&= \text{Max}[\text{data}] \\
\text{Out}[19] &= -4.33116 \\
\text{Out}[20] &= 4.65559 \\
\text{In}[21] &= \text{ghist} = \text{Histogram}[\text{data}, 50, "PDF"]
\end{align*}

\begin{align*}
\text{In}[22] &= \text{gauss} = \text{Exp}[-(x - m)^2 / 2 \cdot s^2] / \sqrt{2 \pi} \\
&= \text{Plot}[\text{gauss}, \{x, -4, 4\} , \text{PlotStyle} \to \text{RGBColor}[1, 0, 0] , \text{PlotRange} \to \text{All}]
\end{align*}
In[124]:= Show[ghist, g]

Out[124]=

In[127]:= data = Table[Random[], {100000}];

In[128]:= data2 = Sqrt[data];

In[129]:= Min[data];
    Max[data];

In[131]:= ghist = Histogram[data2, 50, "PDF"]

Out[131]=

In[132]:= g = Plot[2 x, {x, 0, 1}, PlotStyle -> RGBColor[1, 0, 0], PlotRange -> All]

Out[132]=

その他（確率変数の変数変換 by Mathematica）
In[133] := \textbf{Show[ghist, g]}

Out[133]=

```
rvs.nb
7
```