Article

probDistriCal: The online calculator for probability distributions

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Abstract

In present study, a calculator, probDistriCal, was developed for probability distributions. In the calculator, the probability distributions as normal distribution, *t* distribution, *F* distribution, χ^2 distribution, exponential distribution, power law distribution, Weibull distribution, Zhang Distribution, binomial distribution, Poission distribution, and negative binomial distribution, etc., were available for use. Given a random value, the corresponding probability for a known probability distribution can be calculated. The calculator is web browser based that includes both online and offline versions and can be used on various computing devices (PCs, iPads, smartphones, etc.), operating systems (Windows, Mac, Android, Harmony, etc.) and web browsers (Chrome, Firefox, etc).

Keywords calculator; online; probability; normal distribution; *t* distribution; *F* distribution; χ^2 distribution; exponential distribution; power law distribution; Weibull distribution; Zhang distribution; Poission distribution; Binomial distribution; Negative binomial distribution.

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1 Introduction

Calculation of probability values for various probability distributions is popular in research concerning statistic analyses (Zhang, 2015, 2016, 2018, 2022a-c, 2025a; Zhang and Li, 2015; Bagbag et al., 2024; Shobairi et al., 2024). For field studies as ecological investigations, an online calculator for such calculation is obviously convenient. Therefore, in present study we developed a calculator, probDistriCal, for probability distributions. The calculator is web browser based which includes both online and offline versions and can be used on various computing devices (PCs, iPads, smartphones, etc.), operating systems (Windows, Mac, Android, Harmony, etc.) and web browsers (Chrome, Firefox, etc). Full codes were provided.

2 Probability Distributions

2.1 Continuous distributions

Suppose a random variable X. x is a realization value of X. The probability density function of X is $f(x)$. Some probability distributions are described as follows (Zhang, 2025b):

(1) Normal distribution, $N(\mu, \sigma)$:

$$f(x)=\frac{1}{\sigma\sqrt{2\pi}}e^{-\frac{(x-\mu)^2}{2\sigma^2}}$$

where, μ: mean, σ: standard deviation, and $\sigma>0$.

Let

$$z=\frac{x-\mu}{\sigma}$$

then $z\sim N(0, 1)$, i.e., z follows the standard normal distribution $N(0, 1)$.

(2) t distribution (Zhang, 2015, 2016b, 2018, 2022a, 2022c; Zhang and Li, 2015), $t(n)$:

$$f(x)=\frac{\Gamma(\frac{n+1}{2})}{\sqrt{n\pi}\Gamma(\frac{n}{2})}(1+\frac{x^2}{n})^{-\frac{n+1}{2}}$$

where, n: a positive integer (degree of freedom).

(3) F distribution (Zhang and Qi, 2024), $F(m,n)$:

$$f(x)=\frac{\Gamma(\frac{m+n}{2})m^{\frac{m}{2}}n^{\frac{n}{2}}}{\Gamma(\frac{m}{2})\Gamma(\frac{n}{2})}\frac{x^{\frac{m}{2}-1}}{(mx+n)^{\frac{m+n}{2}}} \quad , x>0$$

$f(x)=0$, $x\leq 0$

where, m, n: positive integers (degree of freedom).

(4) χ^2 distribution (Zhang, 2025b), $\chi^2(n)$:

$$f(x)=\frac{1}{2^{\frac{n}{2}}\Gamma(\frac{n}{2})}x^{\frac{n}{2}-1}e^{-\frac{x}{2}}$$

where, n: a positive integer (degree of freedom).

(5) Exponential distribution (Zhang, 2025b), $Exp(\lambda)$:

$f(x)=\lambda e^{-\lambda x}$, $x\geq 0$

$f(x)=0$, $x<0$

where $\lambda>0$.

(6) Power law distribution (Zhang, 2016a-b, 2017, 2023), $Pow(\alpha)$:

$f(x)=x^{-\alpha}$, $x\geq x_{\min}$

$f(x)=0$, $x<x_{\min}$

where, $\alpha>0$.

(7) Weibull distribution (Zhang, 2025b), $W(m,v,x_0)$:

$$f(x)=\frac{m}{x_0}(x-v)^{m-1}e^{-\frac{(x-v)^m}{x_0}}, \quad x\geq v$$

$f(x)=0$, $x<v$

where, $m>0$, $x_0>0$, and v are constants.

(8) Zhang distribution (Zhang, 2011), $Z(\alpha,\beta,\gamma,a,b)$:

$f(x)=\alpha(x-a)^{\beta}(b-x)^{\gamma}$, $a\leq x\leq b$

$f(x)=0$, $x>a$ or $x<b$

$\alpha>0$, $\beta\geq 0$, $\gamma\geq 0$

where, α: scale parameter; β, γ: shape parameters; a, b: position parameters.

Given x we can calculate the corresponding probability $P=F(x)=P(X<x)=\int_{-\infty}^{x} f(x)\,dx$, where P is the probability that the random variable X takes a value less than x, and $p=1-P$ is the probability that the random variable X takes a value not less than x.

2.2 Discrete distributions

Suppose that P_r is the probability that event A occurs r times, then we have the following discrete distributions:

(1) Binomial distribution (Zhang, 2007; Liu and Zhang, 2011), $B(n, p)$:

$P_r=C_r^n p^r q^{n-r}$

$r>0$

where, P_r is the the probability that event A occurs r times in n trials, p is the probability of event A occurring in each trial.

(2) Poission distribution (Zhang, 2007; Liu and Zhang, 2011), $Poi(\lambda)$:

$P_r=e^{-\lambda}\lambda^r/r!$

$r>0$

where, P_r is the the probability that event A occurs r times, and λ is the mean, $\lambda>0$.

(3) Negative binomial distribution (Zhang, 2007; Liu and Zhang, 2011), $Neg(K,P)$:

$P_r=(K+r-1)!\,P^r/[r!\,(K-1)!\,Q^{K+r}]$

$r>0$

where, P_r is the the probability that event A occurs r times, $Q=1+P$.

3 Calculator

Based on the previous description, I delveloped the calculator, probDistriCal, for probability distributions. It includes both online (http://www.iaees.org/publications/journals/ces/articles/2025-15(2)/probDistriCal.htm) and offline versions, and can be used for various computing devices (PCs, iPads, smartphones, etc.), operating systems (Windows, Mac, Android, Harmony, etc.) and web browsers (Chrome, Firefox, Sougo, 360, etc)(Fig. 1). It can be used in experimental sciences such as medicine, biology, ecology, psychology, sociology, economy, physics and chemistry etc.

Both user manual guide and offline tool can be found at:

http://www.iaees.org/publications/journals/ces/articles/2025-15(2)/e-suppl/probDistriCal.rar

Double-click the offline tool, it will be opened in the default web browser.

The following are full Javascript codes of the calculator, probDistriCal:

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta contentType="text/html; charset=utf-8">
<meta name="description" content="probDistriCal: The online calculator for probability distributions" />
<meta name="keywords" content="probability distributions, online calculator, lookup table" />
<meta name="author" content="W. J. Zhang, Y. H. Qi" />
<link href="../../../../../style.css" rel="stylesheet" media="screen" type="text/css">
<title>probDistriCal: The online calculator for probability distributions</title>
<!-- Google tag (gtag.js) -->
<script async src="https://www.googletagmanager.com/gtag/js?id=G-S56S6PGDYX"></script>
<script>
  window.dataLayer = window.dataLayer || [];
  function gtag(){dataLayer.push(arguments);}
  gtag('js', new Date());
  gtag('config', 'G-S56S6PGDYX');
</script>
</head>

<body>

<script language="javascript">

function np(nv,miu,sigma) {
var xxx,yyy,sss,rrr,zzz,jjj,kkk,lll,nvv,dd;
nv=(nv-miu)/sigma;
dd=2000;
xxx=1;
yyy=1;
nvv=nv*nv;
if (nvv<1) {
sss=dd;
rrr=yyy;
zzz=1/nvv; }
else {
sss=yyy;
```

```
rrr=dd;
zzz=nvv; }
jjj=2.0/9/sss;
kkk=2.0/9/rrr;
lll=Math.abs((1-kkk)*Math.pow(zzz,1/3.0)-1+jjj)/Math.sqrt(kkk*Math.pow(zzz,2/3.0)+jjj);
if (rrr<4) lll*=1+0.08+Math.pow(lll,4)/Math.pow(rrr,3);
xxx=0.5/Math.pow(1+lll*(0.196854+lll*(0.115194+lll*(0.000344+lll*0.019527))),4);
if (nvv<1) xxx=1-xxx;
if (nv<0) xxx=1-xxx;
return xxx; }

function tp(tv,dd) {
var xxx,yyy,sss,rrr,zzz,jjj,kkk,lll,tvv;
xxx=1;
yyy=1;
tvv=tv*tv;
if (tvv<1) {
sss=dd;
rrr=yyy;
zzz=1/tvv; }
else {
sss=yyy;
rrr=dd;
zzz=tvv; }
jjj=2.0/9/sss;
kkk=2.0/9/rrr;
lll=Math.abs((1-kkk)*Math.pow(zzz,1/3.0)-1+jjj)/Math.sqrt(kkk*Math.pow(zzz,2/3.0)+jjj);
if (rrr<4) lll*=1+0.08+Math.pow(lll,4)/Math.pow(rrr,3);
xxx=0.5/Math.pow(1+lll*(0.196854+lll*(0.115194+lll*(0.000344+lll*0.019527))),4);
if (tvv<1) xxx=1-xxx;
return xxx; }

function fp(f,ii,ff) {
var t,z,v,aa,ss,xt,jjj,kkk;
xt=1;
if (f<1) {
ss=ff;
t=ii;
z=1/f; }
else {
ss=ii;
t=ff;
z=f; }
jjj=2.0/9/ss;
kkk=2.0/9/t;
v=Math.abs((1-kkk)*Math.exp(1.0/3*Math.log(z))-1+jjj)/Math.sqrt(kkk*Math.exp(2.0/3*Math.log(z))+jjj);
if (t<4) v*=1+0.08*Math.pow(v,4)/(Math.pow(t,3));
xt=0.5/Math.pow(Math.pow(1+v*(0.196854+v*(0.115194+v*(3.44e-04+v*0.019527))),2),2);
xt=Math.round(xt*100000+0.5)/100000.00;
if (f<=1) xt=1-xt;
aa=xt;       //if aa<=0.01, statistically significant at 99% level
```

```
return aa; }

function chip(chi,df) {
var i,r,kp,jjj,lll,mm,aa;
r=1;
i=df;
while (i>=2) {
r*=i;
i-=2; }
kp=Math.pow(chi,Math.floor((df+1)/2.0))*Math.exp(-chi/2)/r;
if (df%2==0) jjj=1;
else jjj=Math.sqrt(2/chi/3.1415926);
lll=1;
mm=1;
while (mm>=1e-05) {
df+=2;
mm*=chi/df;
lll+=mm; }
aa=jjj*kp*lll;
aa=1-aa;
return aa; }

function expp(x,lamda) {
if (x<0) return 1;
var aa;
aa=Math.exp(-lamda*x);
return aa; }

function powp(x,alpha,xmin) {
var i,z,y1,y2,y=0,s=Number(xmin);
if (x<xmin) return 1-y;
var n=200;
z=(x-xmin)/n;
for(i=1;i<=n-1;i++) {
y1=Math.pow(s,-alpha);
s=s+z;
y2=Math.pow(s,-alpha);
y=y+(y1+y2)*z/2; }
y=1-y;
return y; }

function weibp(x,m,x0,v) {
var i,z,y1,y2,y=0,s=Number(v);
if (x<v) return 1-y;
var n=200;
z=(x-v)/n;
for(i=1;i<=n-1;i++) {
y1=m/x0*Math.pow(s-v,m-1)*Math.exp(-Math.pow(s-v,m)/x0);
s+=z;
y2=m/x0*Math.pow(s-v,m-1)*Math.exp(-Math.pow(s-v,m)/x0);
y=y+(y1+y2)*z/2; }
```

```
y=1-y;
return y; }

function zhangp(x,alpha,beta,gama,a,b) {
var i,z,y1,y2,y=0,s=Number(a);
if (x<a) return 1-y;
if (x>b) return y;
var n=200;
z=(x-a)/n;
for(i=1;i<=n-1;i++) {
y1=alpha*Math.pow(s-a,beta)*Math.pow(b-s,gama);
s+=z;
y2=alpha*Math.pow(s-a,beta)*Math.pow(b-s,gama);
y=y+(y1+y2)*z/2; }
y=1-y;
return y; }

function binop(r,n,p) {
var i,pr;
pr=Math.pow(1-p,n);
for(i=1;i<=r;i++)
pr=(n-r+1)*p*pr/(r*(1-p));
return pr; }

function poissp(r,lamda) {
var i,pr;
pr=Math.exp(-lamda);
for(i=1;i<=r;i++)
pr=lamda*pr/r;
return pr; }

function negbp(r,K,P) {
var i,pr;
pr=1/Math.pow(1+P,K);
for(i=1;i<=r;i++)
pr=(K+r-1)*P*pr/(r*(1+P));
return pr; }

function runnorm() {
var miu=document.formnorm.miu.value;
var sigma=document.formnorm.sigma.value;
var x=document.formnorm.x.value;
var p=np(x,miu,sigma);
if (p<0) p=0;
var strs1=String(p);
var strs2=String(1-p);
document.formnorm.textnormout1.value=strs1; //p
document.formnorm.textnormout2.value=strs2; //P
}

function runt() {
```

```
var t=document.formt.t.value;
var n=parseInt(document.formt.n.value);
var p=tp(t,n);
if (p<0) p=0;
var strs1=String(p);
var strs2=String(1-p);
document.formt.texttout1.value=strs1; //p
document.formt.texttout2.value=strs2; //P
}

function runf() {
var f=document.formf.f.value;
var m=parseInt(document.formf.m.value);
var n=parseInt(document.formf.n.value);
var p=fp(f,m,n);
if (p<0) p=0;
var strs1=String(p);
var strs2=String(1-p);
document.formf.textfout1.value=strs1; //p
document.formf.textfout2.value=strs2; //P
}

function runchi() {
var chi=document.formchi.chi.value;
var n=parseInt(document.formchi.n.value);
var p=chip(chi,n);
if (p<0) p=0;
var strs1=String(p);
var strs2=String(1-p);
document.formchi.textchiout1.value=strs1; //p
document.formchi.textchiout2.value=strs2; //P
}

function runexp() {
var lamda=document.formexp.lamda.value;
var x=document.formexp.x.value;
var p=expp(x,lamda);
if (p<0) p=0;
var strs1=String(p);
var strs2=String(1-p);
document.formexp.textexpout1.value=strs1; //p
document.formexp.textexpout2.value=strs2; //P
}

function runpow() {
var alpha=document.formpow.alpha.value;
var xmin=document.formpow.xmin.value;
var x=document.formpow.x.value;
var p=powp(x,alpha,xmin);
if (p<0) p=0;
var strs1=String(p);
```

```
var strs2=String(1-p);
document.formpow.textpowout1.value=strs1; //p
document.formpow.textpowout2.value=strs2; //P
}

function runweib() {
var m=document.formweib.m.value;
var x0=document.formweib.x0.value;
var v=document.formweib.v.value;
var x=document.formweib.x.value;
var p=weibp(x,m,x0,v);
if (p<0) p=0;
var strs1=String(p);
var strs2=String(1-p);
document.formweib.textweibout1.value=strs1; //p
document.formweib.textweibout2.value=strs2; //P
}

function runzhang() {
var alpha=document.formzhang.alpha.value;
var beta=document.formzhang.beta.value;
var gama=document.formzhang.gama.value;
var a=document.formzhang.a.value;
var b=document.formzhang.b.value;
var x=document.formzhang.x.value;
var p=zhangp(x,alpha,beta,gama,a,b);
if (p<0) p=0;
var strs1=String(p);
var strs2=String(1-p);
document.formzhang.textzhangout1.value=strs1; //p
document.formzhang.textzhangout2.value=strs2; //P
}

function runbino() {
var n=parseInt(document.formbino.n.value);
var p=document.formbino.p.value;
var r=parseInt(document.formbino.r.value);
var strs=String(binop(r,n,p));
document.formbino.textbinoout.value=strs; //Pr
}

function runpoiss() {
var lamda=document.formpoiss.lamda.value;
var r=parseInt(document.formpoiss.r.value);
var strs=String(poissp(r,lamda));
document.formpoiss.textpoissout.value=strs; //Pr
}

function runnegb() {
var K=document.formnegb.K.value;
var P=document.formnegb.P.value;
```

```
var r=parseInt(document.formnegb.r.value);
var strs=String(negbp(r,K,P));
document.formnegb.textnegbout.value=strs; //Pr
}

</script>

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<br>
<div id="pagehead"></div>
<div align=center><b><h2>probDistriCal</h2></b></div>
<div align=center><b><h3>The Online Calculator For Probability Distributions</h3></b></div>
<div align=center><b><h4>By W. J. Zhang and Y. H. Qi</h4></b></div>
<br>

<br>The user manual guide and suggested citation of this page:
<br>
<b><a href="http://www.iaees.org/publications/journals/ces/articles/2025-15(2)/calculator-for-probability-distributions.pdf">Zhang W. J., Qi Y. H. 2025. probDistriCal: The online calculator for probability distributions. Computational Ecology and Software, 15(2): 57-77</a></b>
<br>Also, click <a href="http://www.iaees.org/publications/journals/ces/articles/2025-15(2)/3-Zhang-Abstract.asp"><b>here</b></a> to download the corresponding offline calculator.
<br><br>
<hr>

<b><a href="#cont">Continuous Distributions</a></b>
<ul>
<li><a href="#n">Normal Distribution</a></li>
<li><a href="#t"><i>t</i> Distribution</a></li>
<li><a href="#f"><i>F</i> Distribution</a></li>
<li><a href="#chi"><i>χ</i><sup>2</sup> Distribution</a></li>
<li><a href="#exp">Exponential Distribution</a></li>
<li><a href="#pow">Power Law Distribution</a></li>
<li><a href="#weib">Weibull Distribution</a></li>
<li><a href="#zhang">Zhang Distribution</a></li>
</ul>
<b><a href="#disc">Discrete Distributions</a></b>
<ul>
<li><a href="#bino">Binomial Distribution</a></li>
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<li><a href="#poiss">Poission Distribution</a></li>
<li><a href="#negb">Negative Binomial Distribution</a></li>
</ul>
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<font face="Times New Roman" size=6>
<b><div id="cont">Continuous Distributions</div></b>
</font>
<br>

<font face="Times New Roman" size=5>
<b><div id="n">Normal Distribution</div></b>
</font>
<br>

<form name="formnorm">
Mean (<i>μ</i>): <input type="text" name="miu" value="">
<br><br>
Standard deviation (<i>σ</i>): <input type="text" name="sigma" value="">
<br><br>
Random variable (<i>x</i>): <input type="text" name="x" value="">
<br><br>
<input type="button" name="buttonnorm" value="Run" style="width:100px;" onClick="runnorm()">
<br><br>
<i>p</i>-value</i> (Probability that the random variable <i>X</i> takes a value not less than <i>x</i>):
<br>
<textarea id="textnormout1" name="textnormout1" rows="1" cols="30" style="background:cyan;font-family:Times New Roman;font-size:11pt;color:black" wrap="off" value="     " readonly>
</textarea>
<br>
<i>P</i> (Probability that the random variable <i>X</i> takes a value less than <i>x</i>):
<br>
<textarea id="textnormout2" name="textnormout2" rows="1" cols="30" style="background:cyan;font-family:Times New Roman;font-size:11pt;color:black" wrap="off" value="     " readonly>
</textarea>
<br><br>
</form>
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User manual guide:
<br><a
href="http://www.iaees.org/publications/journals/ces/articles/2025-15(2)/calculator-for-probability-distributions.pdf">Zhang W. J., Qi Y. H. 2025. probDistriCal: The online calculator for probability distributions. Computational Ecology and Software, 15(2): 57-77</a></b>
</font>
<br><br>
<a href="#pagehead" style="background-color:lightgray;border-style:solid;border-color:silver">   Back to Top   </a>
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<hr color=maroon size="2px"><br>
```

```
<font face="Times New Roman" size=5>
<b><div id="t"><i>t</i> Distribution</div></b>
</font>
<br>

<form name="formt">
Degree of freedom (<i>n</i>): <input type="text" name="n" value="">
<br><br>
Random variable (<i>x</i>): <input type="text" name="t" value="">
<br><br>
<input type="button" name="buttont" value="Run" style="width:100px;" onClick="runt()">
<br><br>
<i>p</i>-value</i> (Probability that the random variable <i>X</i> takes a value not less than <i>x</i>):
<br>
<textarea id="texttout1" name="texttout1" rows="1" cols="30" style="background:cyan;font-family:Times New Roman;font-size:11pt;color:black" wrap="off" value="  " readonly>
</textarea>
<br>
<i>P</i> (Probability that the random variable <i>X</i> takes a value less than <i>x</i>):
<br>
<textarea id="texttout2" name="texttout2" rows="1" cols="30" style="background:cyan;font-family:Times New Roman;font-size:11pt;color:black" wrap="off" value="  " readonly>
</textarea>
<br><br>
</form>
<font face="Times New Roman" size=1 color=green>
User manual guide:
<br><a
href="http://www.iaees.org/publications/journals/ces/articles/2025-15(2)/calculator-for-probability-distributions.pdf">Zhang W. J., Qi Y. H. 2025. probDistriCal: The online calculator for probability distributions. Computational Ecology and Software, 15(2): 57-77</a></b>
</font>
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<hr color=maroon size="2px"><br>

<font face="Times New Roman" size=5>
<b><div id="f"><i>F</i> Distribution</div></b>
</font>
<br>

<form name="formf">
1st degree of freedom (<i>m</i>): <input type="text" name="m" value="">
<br><br>
2nd degree of freedom (<i>n</i>): <input type="text" name="n" value="">
<br><br>
Random variable (<i>x</i>): <input type="text" name="f" value="">
<br><br>
<input type="button" name="buttonf" value="Run" style="width:100px;" onClick="runf()">
```

```
<br><br>
<i>p</i>-value</i> (Probability that the random variable <i>X</i> takes a value not less than <i>x</i>):
<br>
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<i>P</i> (Probability that the random variable <i>X</i> takes a value less than <i>x</i>):
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User manual guide:
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<font face="Times New Roman" size=5>
<b><div id="chi"><i>χ</i><sup>2</sup> Distribution</div></b>
</font>
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<form name="formchi">
Degree of freedom (<i>n</i>): <input type="text" name="n" value="">
<br><br>
Random variable (<i>x</i>): <input type="text" name="chi" value="">
<br><br>
<input type="button" name="buttonchi" value="Run" style="width:100px;" onClick="runchi()">
<br><br>
<i>p</i>-value</i> (Probability that the random variable <i>X</i> takes a value not less than <i>x</i>):
<br>
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<i>P</i> (Probability that the random variable <i>X</i> takes a value less than <i>x</i>):
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<font face="Times New Roman" size=5>
<b><div id="exp">Exponential Distribution</div></b>
</font>
<br>

<form name="formexp">
Parameter (<i>λ</i>): <input type="text" name="lamda" value="">
<br><br>
Random variable (<i>x</i>): <input type="text" name="x" value="">
<br><br>
<input type="button" name="buttonexp" value="Run" style="width:100px;" onClick="runexp()">
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<i>p</i>-value</i> (Probability that the random variable <i>X</i> takes a value not less than <i>x</i>):
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<font face="Times New Roman" size=5>
<b><div id="pow">Power Law Distribution</div></b>
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<form name="formpow">
Parameter (<i>α</i>): <input type="text" name="alpha" value="">
<br><br>
Parameter (<i>x</i><sub>min</sub>): <input type="text" name="xmin" value="">
<br><br>
Random variable (<i>x</i>): <input type="text" name="x" value="">
<br><br>
<input type="button" name="buttonpow" value="Run" style="width:100px;" onClick="runpow()">
<br><br>
<i>p</i>-value</i> (Probability that the random variable <i>X</i> takes a value not less than <i>x</i>):
<br>
<textarea id="textpowout1" name="textpowout1" rows="1" cols="30" style="background:cyan;font-family:Times New Roman;font-size:11pt;color:black" wrap="off" value="  " readonly>
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<i>P</i> (Probability that the random variable <i>X</i> takes a value less than <i>x</i>):
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<font face="Times New Roman" size=5>
<b><div id="weib">Weibull Distribution</div></b>
</font>
<br>

<form name="formweib">
Parameter (<i>m</i>): <input type="text" name="m" value="">
<br><br>
Parameter (<i>x</i><sub>0</sub>): <input type="text" name="x0" value="">
<br><br>
```

```
Parameter (<i>v</i>): <input type="text" name="v" value="">
<br><br>
Random variable (<i>x</i>): <input type="text" name="x" value="">
<br><br>
<input type="button" name="buttonweib" value="Run" style="width:100px;" onClick="runweib()">
<br><br>
<i>p</i>-value</i> (Probability that the random variable <i>X</i> takes a value not less than <i>x</i>):
<br>
<textarea id="textweibout1" name="textweibout1" rows="1" cols="30" style="background:cyan;font-family:Times New Roman;font-size:11pt;color:black" wrap="off" value="  " readonly>
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<i>P</i> (Probability that the random variable <i>X</i> takes a value less than <i>x</i>):
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<font face="Times New Roman" size=5>
<b><div id="zhang">Zhang Distribution</div></b>
</font>
<br>

<form name="formzhang">
Parameter (<i>α</i>): <input type="text" name="alpha" value="">
<br><br>
Parameter (<i>β</i>): <input type="text" name="beta" value="">
<br><br>
Parameter (<i>γ</i>): <input type="text" name="gama" value="">
<br><br>
Parameter (<i>a</i>): <input type="text" name="a" value="">
<br><br>
Parameter (<i>b</i>): <input type="text" name="b" value="">
<br><br>
Random variable (<i>x</i>): <input type="text" name="x" value="">
<br><br>
<input type="button" name="buttonzhang" value="Run" style="width:100px;" onClick="runzhang()">
```

```
<br><br>
<i>p</i>-value</i> (Probability that the random variable <i>X</i> takes a value not less than <i>x</i>):
<br>
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<i>P</i> (Probability that the random variable <i>X</i> takes a value less than <i>x</i>):
<br>
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<font face="Times New Roman" size=6>
<b><div id="disc">Discrete Distributions</div></b>
</font>
<br>

<font face="Times New Roman" size=5>
<b><div id="bino">Binomial Distribution</div></b>
</font>
<br>

<form name="formbino">
Parameter (<i>n</i>): <input type="text" name="n" value="">
<br><br>
Parameter (<i>p</i>): <input type="text" name="p" value="">
<br><br>
Random variable (<i>r</i>): <input type="text" name="r" value="">
<br><br>
<input type="button" name="buttonbino" value="Run" style="width:100px;" onClick="runbino()">
<br><br>
<i>P<sub>r</sub></i> (Probability that the random variable takes the value <i>r</i>):
<br>
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<font face="Times New Roman" size=5>
<b><div id="poiss">Poission Distribution</div></b>
</font>
<br>

<form name="formpoiss">
Parameter (<i>λ</i>): <input type="text" name="lamda" value="">
<br><br>
Random variable (<i>r</i>): <input type="text" name="r" value="">
<br><br>
<input type="button" name="buttonpoiss" value="Run" style="width:100px;" onClick="runpoiss()">
<br><br>
<i>P<sub>r</sub></i> (Probability that the random variable takes the value <i>r</i>):
<br>
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<b><div id="negb">Negative Binomial Distribution</div></b>
</font>
<br>
```

```
<form name="formnegb">
Parameter (<i>K</i>): <input type="text" name="K" value="">
<br><br>
Parameter (<i>P</i>): <input type="text" name="P" value="">
<br><br>
Random variable (<i>r</i>): <input type="text" name="r" value="">
<br><br>
<input type="button" name="buttonnegb" value="Run" style="width:100px;" onClick="runnegb()">
<br><br>
<i>P<sub>r</sub></i> (Probability that the random variable takes the value <i>r</i>):
<br>
<textarea id="textnegbout" name="textnegbout" rows="1" cols="30" style="background:cyan;font-family:Times New Roman;font-size:11pt;color:black" wrap="off" value="  " readonly>
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Web administrator: office@iaees.org, website@iaees.org; <br><br>
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Fig. 1 Online calculator, probDistriCal.

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