```
In[1]:= <<Statistics`ContinuousDistributions`

In[2]:= PDF[ExponentialDistribution[1], x]

Out[2]= e^-x

In[3]:= y = RandomArray[ExponentialDistribution[1], 10]

Out[3]= {0.450618, 3.24541, 0.684699, 0.418888,
  0.110084, 3.08344, 1.18741, 1.87619, 0.399078, 0.508104}

In[4]:= Table[Log[y[[i]]/Log[2]], {i, 10}]

Out[4]= {-0.430622, 1.54375, -0.0122631, -0.503639,
  -1.84, 1.49256, 0.538283, 0.995755, -0.552086, -0.310557}

In[5]:= data[n_, a_, b_] := b (Log[RandomArray[ExponentialDistribution[1], n]/Log[2]] - a)

In[6]:= x = data[10, 0, 1]

Out[6]= {-2.65808, -0.639485, -0.346612, 0.709369,
  -1.13834, 1.0669, 0.934823, -0.680537, 0.703921, 0.423677}

In[7]:= w = Table[(x[[i]] + x[[j]])/2, {i, 10}, {j, i, 10}]

Out[7]= {{-2.65808, -1.64878, -1.50235, -0.974358,
   -1.89821, -0.795589, -0.861631, -1.66931, -0.977081, -1.1172},
  {-0.639485, -0.493048, 0.0349417, -0.888911, 0.21371, 0.147669,
   -0.660011, 0.032218, -0.107904}, {-0.346612, 0.181379,
   -0.742474, 0.360147, 0.294105, -0.513574, 0.178655, 0.0385325},
  {0.709369, -0.214484, 0.888137, 0.822096, 0.0144159, 0.706645, 0.566523},
  {-1.13834, -0.035716, -0.101757, -0.909437, -0.217208, -0.35733},
  {1.0669, 1.00086, 0.193184, 0.885413, 0.745291},
  {0.934823, 0.127143, 0.819372, 0.67925},
  {-0.680537, 0.0116922, -0.12843}, {0.703921, 0.563799}, {0.423677}}

In[8]:= w = Flatten[w]

Out[8]= {-2.65808, -1.64878, -1.50235, -0.974358, -1.89821, -0.795589,
  -0.861631, -1.66931, -0.977081, -1.1172, -0.639485, -0.493048, 0.0349417,
  -0.888911, 0.21371, 0.147669, -0.660011, 0.032218, -0.107904, -0.346612,
  0.181379, -0.742474, 0.360147, 0.294105, -0.513574, 0.178655, 0.0385325,
  0.709369, -0.214484, 0.888137, 0.822096, 0.0144159, 0.706645, 0.566523,
  -1.13834, -0.035716, -0.101757, -0.909437, -0.217208, -0.35733, 1.0669,
  1.00086, 0.193184, 0.885413, 0.745291, 0.934823, 0.127143, 0.819372,
  0.67925, -0.680537, 0.0116922, -0.12843, 0.703921, 0.563799, 0.423677}

In[9]:= w = Sort[w]

Out[9]= {-2.65808, -1.89821, -1.66931, -1.64878, -1.50235, -1.13834, -1.1172,
  -0.977081, -0.974358, -0.909437, -0.888911, -0.861631, -0.795589,
  -0.742474, -0.680537, -0.660011, -0.639485, -0.513574, -0.493048,
  -0.35733, -0.346612, -0.217208, -0.214484, -0.12843, -0.107904, -0.101757,
  -0.035716, 0.0116922, 0.0144159, 0.032218, 0.0349417, 0.0385325, 0.127143,
  0.147669, 0.178655, 0.181379, 0.193184, 0.21371, 0.294105, 0.360147,
  0.423677, 0.563799, 0.566523, 0.67925, 0.703921, 0.706645, 0.709369,
  0.745291, 0.819372, 0.822096, 0.885413, 0.888137, 0.934823, 1.00086, 1.0669}
```

In[10]:=
```
m = Length[w]
```
Out[10]= 55

In[11]:=
```
{Floor[(m + 1)/2], Floor[(m + 2)/2]}
```
Out[11]= {28, 28}

In[12]:=
```
{Floor[(54 + 1)/2], Floor[(54 + 2)/2]}
```
Out[12]= {27, 28}

In[13]:=
```
(w[[Floor[(m+1)/2]]] + w[[Floor[(m+2)/2]]])/2
```
Out[13]= 0.0116922

In[14]:=
```
hodgesLehamann[x_] := Module[{w, n, m},
  n = Length[x];
  w = Sort[Flatten[Table[(x[[i]] + x[[j]])/2, {i, n}, {j, i, n}]]];
  m = Length[w];
  (w[[Floor[(m+1)/2]]] + w[[Floor[(m+2)/2]]])/2]
```

In[15]:=
```
hodgesLehamann[x]
```
Out[15]= 0.0116922

In[16]:=
```
s = 0; s2 = 0;
```

In[17]:=
```
Do[g = Abs[hodgesLehamann[data[10, 0.2, 1.1]] - 0.2];
  s = s + g; s2 = s2 + g^2, {100}]
```

In[18]:=
```
mae = s/100
```
Out[18]= 0.589515

In[19]:=
```
sig = Sqrt[s2/100 - mae^2]
```
Out[19]= 0.399075

```
In[20]:= err = 2 sig / Sqrt[100]

Out[20]= 0.079815

In[21]:= Sim[k_, n_, a_, b_] := Module[{g, s, s2, mae, sig},
           s = 0; s2 = 0;
           Do[g = Abs[hodgesLehamann[data[n, a, b]] - a];
            s = s + g; s2 = s2 + g^2, {k}];
           mae = s / k;
           sig = Sqrt[s2 / k - mae^2];
           {mae, 2 sig / Sqrt[k]}]

In[22]:= Sim[1000, 10, 0.2, 1.1]

Out[22]= {0.617121, 0.02474}
```