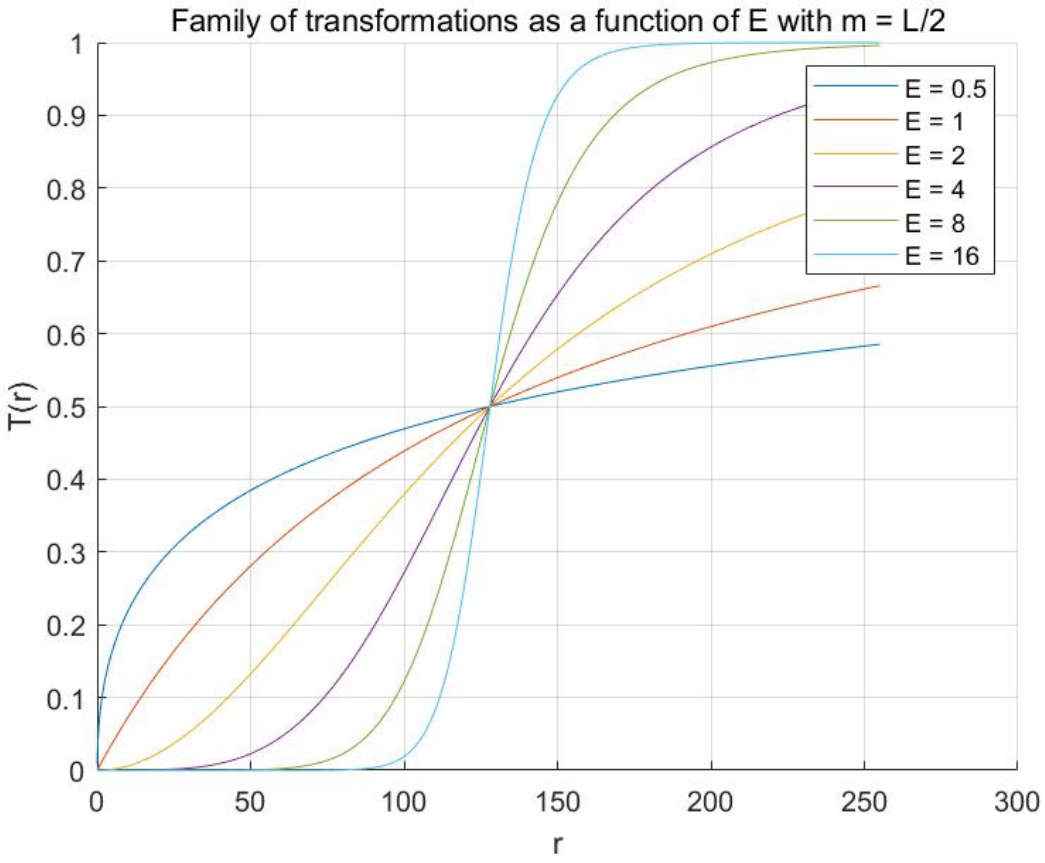
相贤泰

1. 解

   (a)

$$T(r) = \frac{1}{1 + (\frac{m}{r})^E}$$

   (b) 不同E值情况如下图



2. 解

   由

$$s_k = (L-1)\sum_{j=0}^{k} p_r(r_j)$$

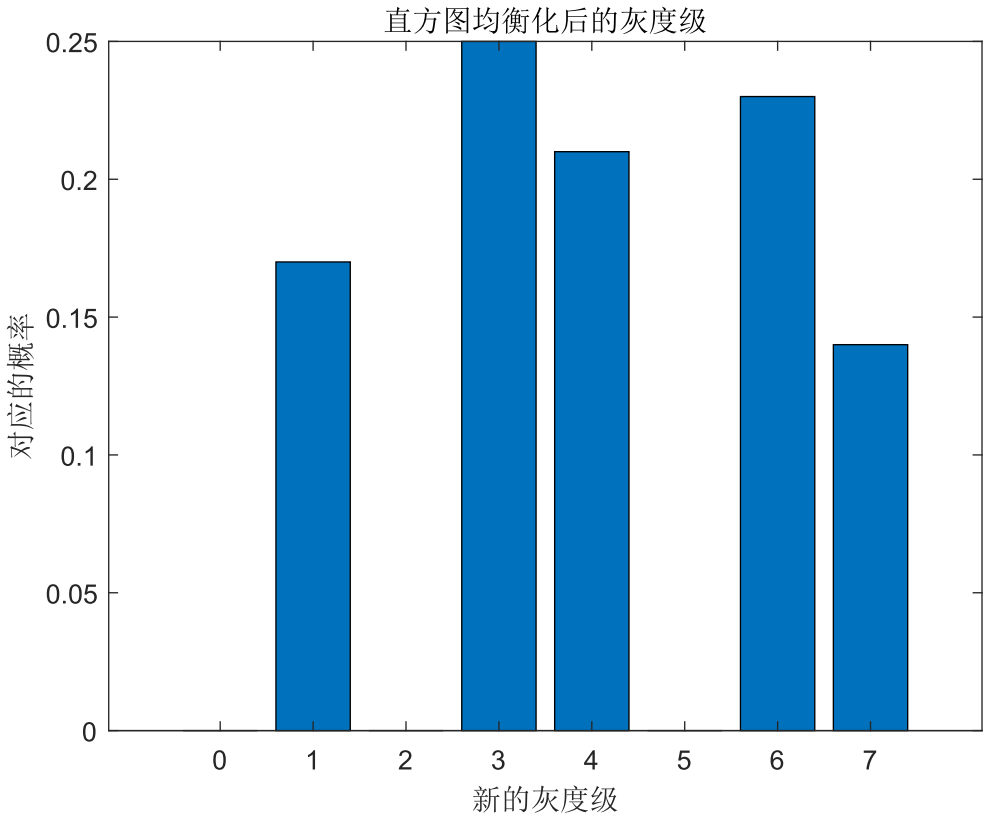
   可求

$$\mathbf{s} = [1, 3, 4, 6, 6, 6, 7, 7]$$

   对应概率为

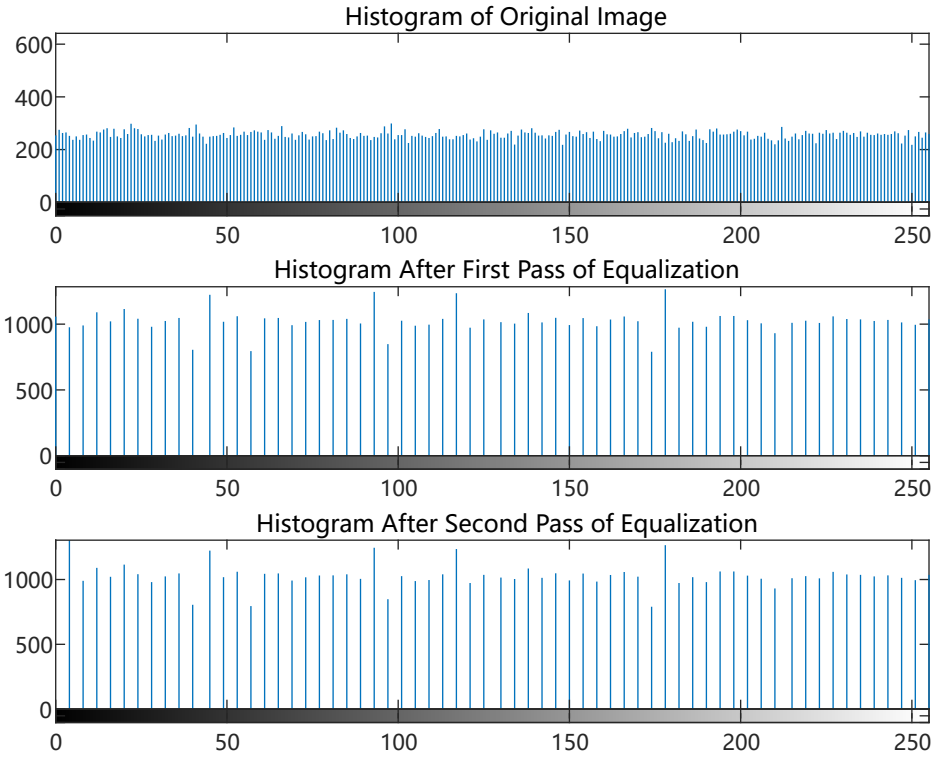
$$p_s(\mathbf{s}) = [0, 0.17, 0, 0.25, 0.21, 0, 0.23, 0.14]$$

相应直方图为



3. 解

验证情况如下



4. 解

$$T(r)=\frac{1}{\sqrt{2\pi}\sigma}\int_0^r \exp(-\frac{(w-m)^2}{2\sigma^2})dw$$

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5. 解

可知

$$p_z(z)=2z,\ 0\le z\le 1$$
$$p_r(r)=-2r+2,\ 0\le r\le 1$$

那么有

$$s=H(z)=\int_0^z p_z(t)dt=z^2$$

则

$$z=H^{-1}(s)=\sqrt{s}$$

又因为

$$s=T(r)=-r^2+2r$$

所以

$$z=\sqrt{-r^2+2r}$$

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6. 解

(1)

$$[123454321]*[20-2]=[4,4,4,4,0,-4,-4,-4,-4]$$

(2)

$$\begin{vmatrix}-1&0&1\\-2&0&2\\-1&0&1\end{vmatrix}*\begin{vmatrix}1&3&2&0&4\\1&0&3&2&3\\0&4&1&0&5\\2&3&2&1&4\\3&1&0&4&2\end{vmatrix}=\begin{vmatrix}-6&-4&4&-4&2\\-7&-6&3&-6&4\\-11&-4&8&-10&3\\-11&2&5&-10&6\\-5&6&-4&-6&9\end{vmatrix}$$