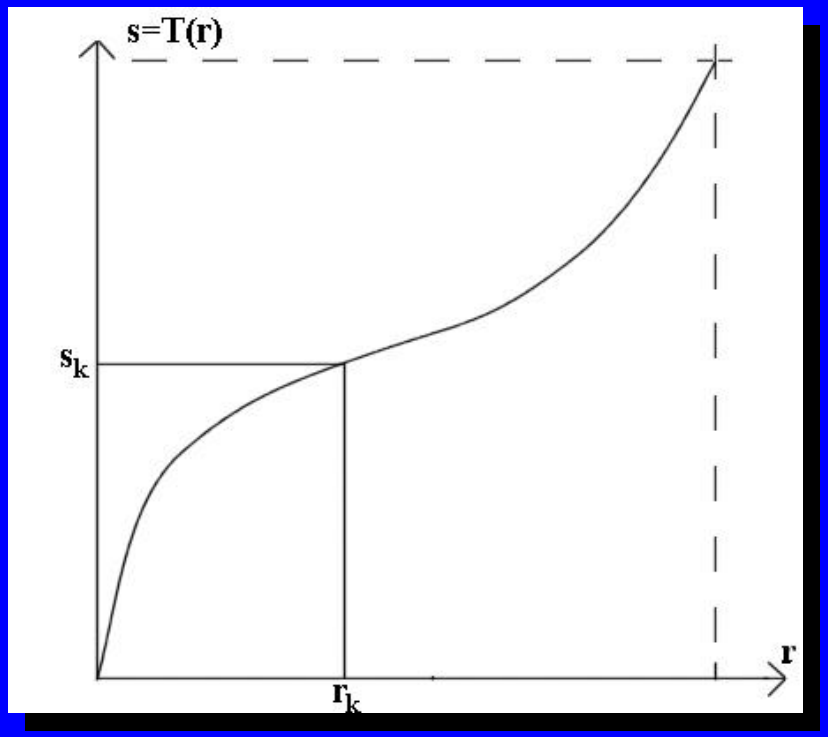
HISTOGRAM

Numerical exercise



$$s = T(r) = \int_0^r p_r(w)dw \quad 0 \le r \le 1$$

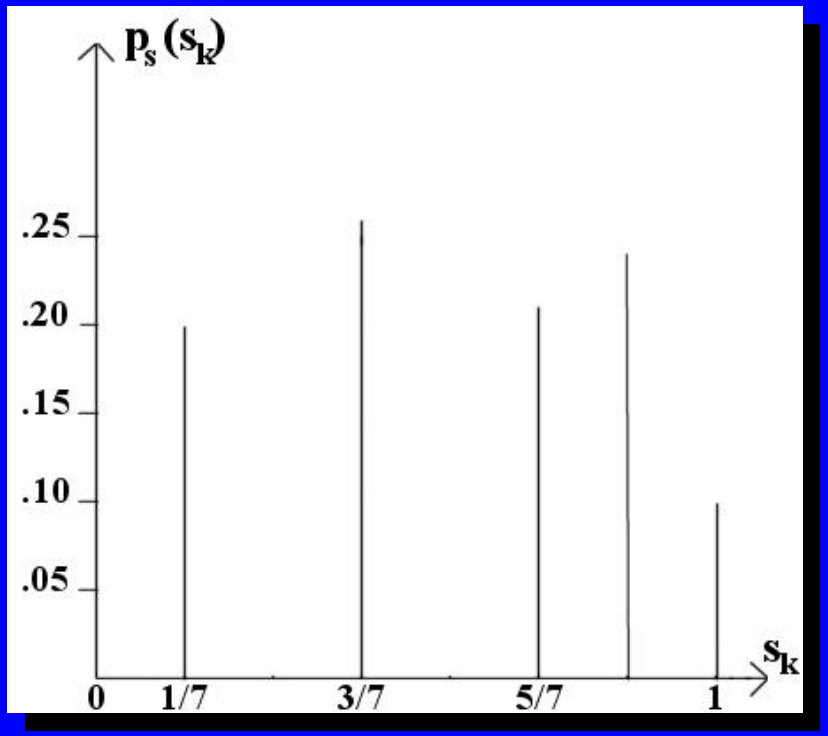
$$s_k = T(r_k) = \sum_{j=0}^{k} \frac{n_j}{n}$$

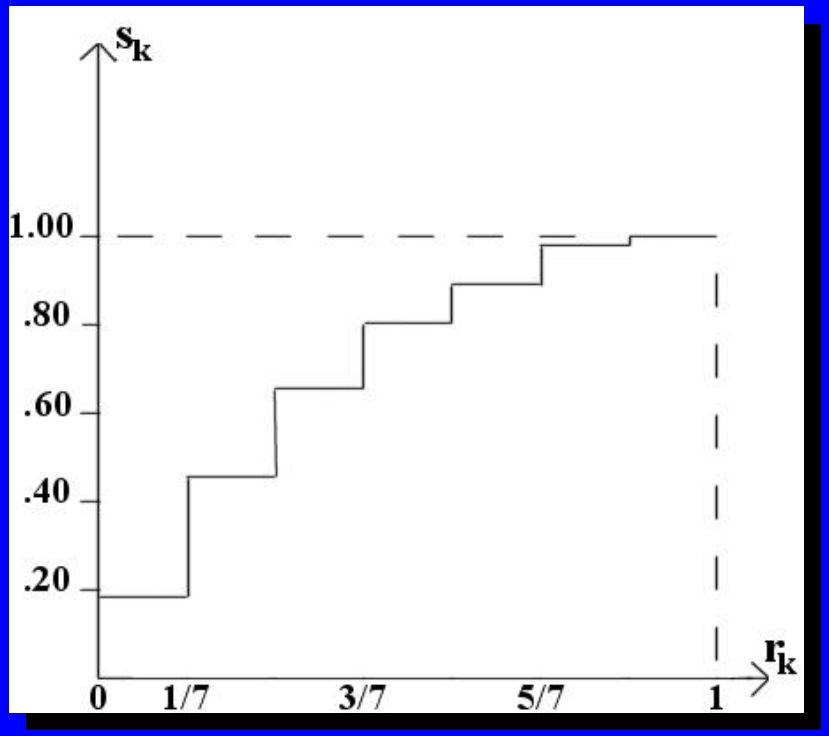
$$= \sum_{j=0}^{k} p_r(r_j)$$

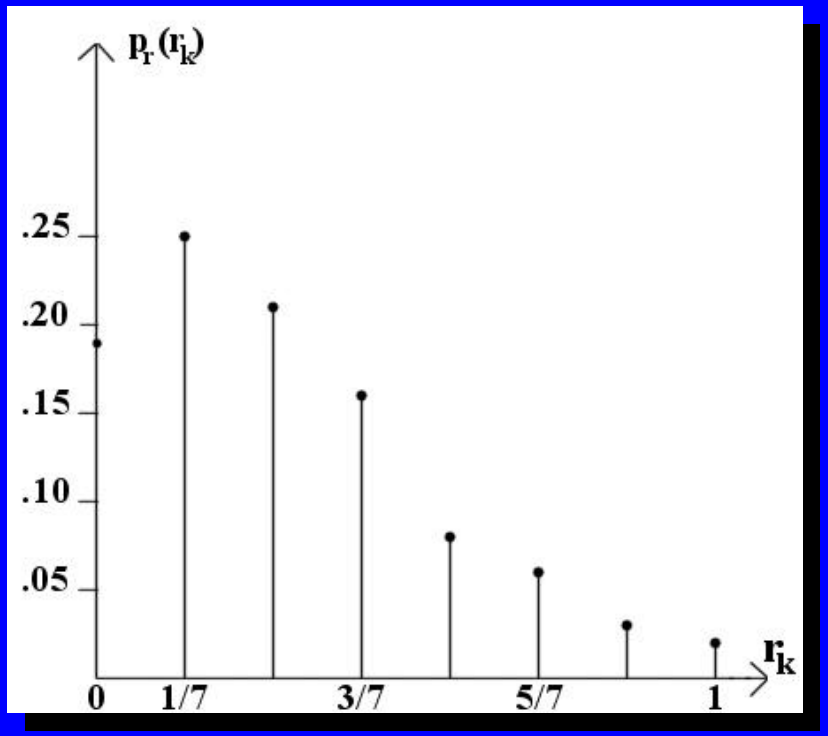
$$0 \le r \le 1$$

$$k = 0,1...,L-1$$

r_k	n_k	$p_r(r_k) = n_k/n$
$r_0 = 0$	790	0.19
$r_1 = 1/7$	1023	0.25
$r_2 = 2/7$	850	0.21
$r_3 = 3/7$	656	0.16
$r_4 = 4/7$	329	0.08
$r_5 = 5/7$	245	0.06
$r_6 = 6/7$	122	0.03
$r_7 = 1$	81	0.02







$$s_0 = T(r_0) = \sum_{j=0}^{0} p_r(r_j)$$

$$= p_r(r_0)$$

$$= 0.19$$

similarly,

$$s_1 = T(r_1) = \sum_{j=0}^{1} p_r(r_j)$$

$$= p_r(r_0) + p_r(r_1)$$

$$= 0.44$$

and: $s_2 = 0.65 \quad s_5 = 0.95$

$s_3 = 0.81 \quad s_6 = 0.98$

$s_4 = 0.89 \quad s_7 = 1$

The tranformation function has the staircase form shown in the previous page. Since only eight equally-spaced levels are allowed in this case, each of the transformed value must be assigned to its closest valid level.

Thus we have: $s_0 \cong 1/7 \quad s_4 \cong 6/7$

$s_1 \cong 3/7 \quad s_5 \cong 1$

$s_2 \cong 5/7 \quad s_6 \cong 1$

$s_3 \cong 6/7 \quad s_7 \cong 1$