a : lower bound of interval
b : upper bound of interval
n : number of bins, $n \geqslant 1$
c : bin width
r : bin overlap ratio
$\bar{r}$: bin non-overlap ratio
s : bin width to interval length ratio

r_k : bin k-overlap ratio, $k \geqslant 1$

a_i : bin lower bound, $i = 1, \ldots, n$
b_i : bin upper bound, $i = 1, \ldots, n$

γ : Ayasdi gain

$$a < b$$
$$0 < c \leqslant b - a$$
$$0 \leqslant r < 1$$

$$a = a_1 < \cdots < a_n < b$$
$$a < b_1 < \cdots < b_n = b$$

$$b_i - a_i \quad = c \ , \quad i = 1, \ldots, n$$
$$b_i - a_{i+1} = rc \ , \quad i = 1, \ldots, n-1$$

$$r_1 \ = \ r$$
$$b_i - a_{i+k} = r_k c \ , \ i = 1, \ldots, n-1, \ k \geqslant 1$$

$$a_{i+1} - a_i = b_{i+1} - b_i = (1-r)c \ , \quad i = 1, \ldots, n-1$$

$$a_i = a + (i-1)(1-r)c \ , \quad i = 1, \ldots, n$$
$$b_i = b - (n-i)(1-r)c \ , \quad i = 1, \ldots, n$$

$$\begin{aligned} c &= b_1 - a_1 \\ &= b_1 - a \\ &= b - (n-1)(1-r)c - a \end{aligned}$$

$$\begin{aligned} b - a &= \big(1 + (n-1)(1-r)\big)c \\ &= \big(1 + (1-r)n - (1-r)\big)c \\ &= \big(r + (1-r)n\big)c \end{aligned}$$

$$\boxed{b - a \ = \ \big(r + (1-r)n\big)c}$$

$$\boxed{n \ = \ \frac{1}{1-r}\left(\frac{b-a}{c} - r\right) \ = \ \frac{1}{1-r}\left(\frac{1}{s} - r\right) \ = \ 1 + \left(\frac{1}{s} - 1\right)\gamma}$$

$$\boxed{c \ = \ \frac{b-a}{r + (1-r)n}}$$

$$\boxed{r \ = \ \frac{1}{n-1}\left(n - \frac{b-a}{c}\right) \ = \ \frac{1}{n-1}\left(n - \frac{1}{s}\right)}$$

$$\boxed{s \ = \ \frac{1}{r + (1-r)n} \ = \ \frac{1}{1 + (n-1)/\gamma}}$$

$$
\begin{aligned}
r_k c &= b_i - a_{i+k} \\
&= \big(b - (n-i)(1-r)c\big) - \big(a + (i+k-1)(1-r)c\big) \\
&= (b-a) - \big((n-i) + (i+k-1)\big)(1-r)c \\
&= \big(r + (1-r)n\big)c - (n+k-1)(1-r)c \\
r_k &= r + (1-r)n - (n+k-1)(1-r) \\
&= 1 - k(1-r)
\end{aligned}
$$

$$\boxed{r_k \;=\; 1 - k(1-r) \;=\; 1 - k/\gamma}$$

$$\boxed{r_k < 0\,,\; \forall\, k \geqslant 2 \;\Leftrightarrow\; r_2 < 0 \;\Leftrightarrow\; r < 0.5 \;\Leftrightarrow\; \gamma < 2}$$

$\bar{r} = 1 - 2r = -r_2$

The bin non-overlap ratio $\bar{r}$ is a sensible indicator only if $r < 0.5$, i.e. $\gamma < 2$.
With $r \geqslant 0.5$, the inner bins (indices $i = 2, \ldots, n-1$) have no proper elements.

A few parameter settings of interest

γ	r	$\bar{r}$	r_2
1.25	20.0%	60%	·
1.60	37.5%	25%	·
2.00	50.0%	00%	00%
2.50	60.0%	·	20%