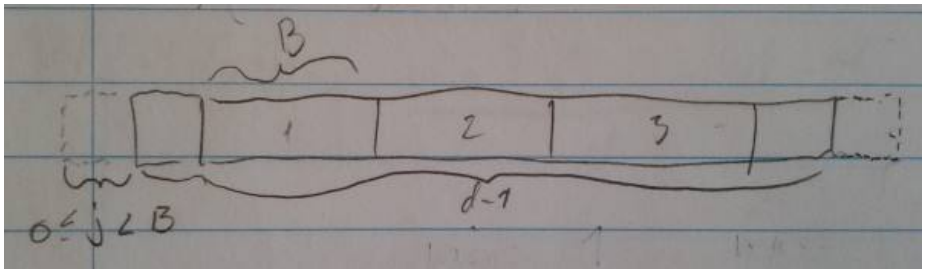
BFS



Under antagelse at vi har uniform fordeling for hvor langt vi scanner og uniform fordeling for hvilke blokke vi vaelger (kan nok reelt ikke antages. Skal maaske laves saerskilt for left/right)

$$
\begin{aligned}
X &: \#\text{cacheline we end up in} \\
S &: \#\text{elements the block is shifted from a cacheline boundary}
\end{aligned}
$$

$$m = \left\lfloor \frac{d-1+B-2}{B} \right\rfloor + 1 \text{ (max antal cachelines}$$

$$P(X=1 \mid S=j) = \frac{\min\{B-j,\, d-1\}}{d-1}$$

$$P(X=i \mid S=j) = \frac{B}{d-1}$$

$$P(X=m \mid S=j) = 1 - \sum_{i=1}^{m-1} P(X=i \mid S=j) \text{ (komplement af de andre, lettest pga. hvis j+d-1<B fx)}$$

$$P(S=j) = \frac{P([d-1]_B \cdot [x]_B = j)}{\sum_{y=0}^{B-1} P([d-1]_B \cdot [x]_B = y)} (\#\text{mulige [x]})$$

$$P(X=i) = \sum_{j=0}^{B-1} P(X=i \mid S=j) P(S=j)$$

$$E(X) = \sum_{i=1}^{m} i \cdot P(X=i)$$

I alt, ish.
$\log_d n \cdot E(X) - \log_d \frac{B}{d-1} - \log_d \frac{M}{d-1}$
Resultat (B=16, M=16384, n=1000000)

d	$E(X)$	$\log_d n \cdot E(X)$	$\log_d n \cdot E(X) - \log_d \frac{B}{d-1} - \log_d \frac{M}{d-1}$
2	1	19.932	1.932
3	1	12.575	2.481
4	1.063	10.589	3.174
5	1	8.584	2.555
6	1.125	8.674	3.508
7	1.125	7.987	3.417
8	1.188	7.89	3.761
9	1	6.288	2.502
10	1.25	7.5	3.99
11	1.25	7.202	3.919
12	1.313	7.297	4.206
13	1.25	6.733	3.806
14	1.375	7.198	4.414
15	1.375	7.015	4.357
16	1.438	7.163	4.616
17	1	4.876	2.43
25	1.333	5.723	3.821
33	1.5	5.927	4.341
65	2.5	8.274	7.278

Resultat (B=16, M=16384, n=1000000000)

d	$\log_d n \cdot E(X) - \log_d \frac{B}{d-1} - \log_d \frac{M}{d-1}$
2	11.897
3	8.768
5	6.847
9	5.646
17	4.868
33	7.304
65	11.415