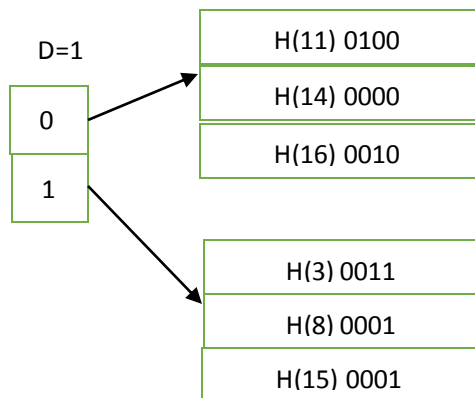


一、

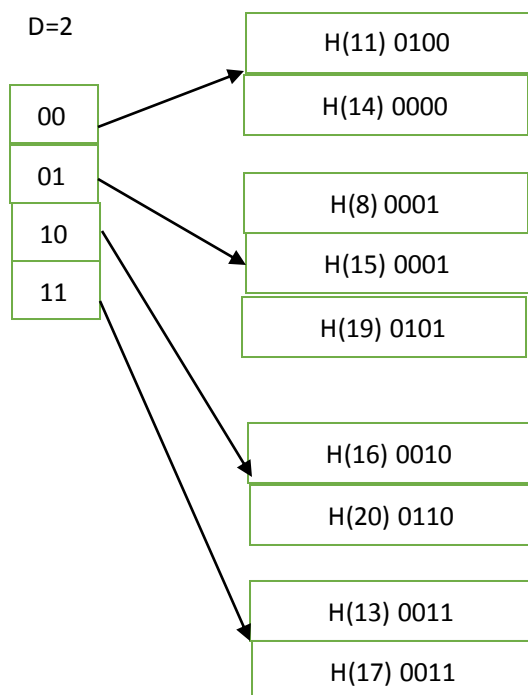
H(3)	H(8)	H(11)	H(14)	H(15)	H(16)	H(17)	H(19)	H(20)	H(33)	H(43)	H(48)
3	1	4	0	1	2	3	5	6	5	1	6

(1)

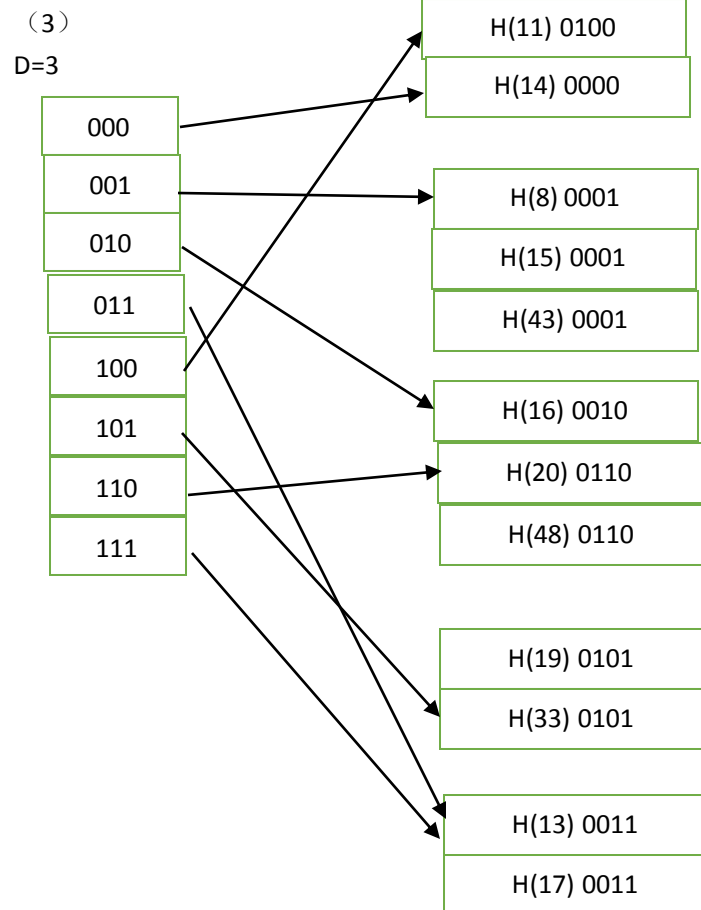


放到 16 时，放不下了

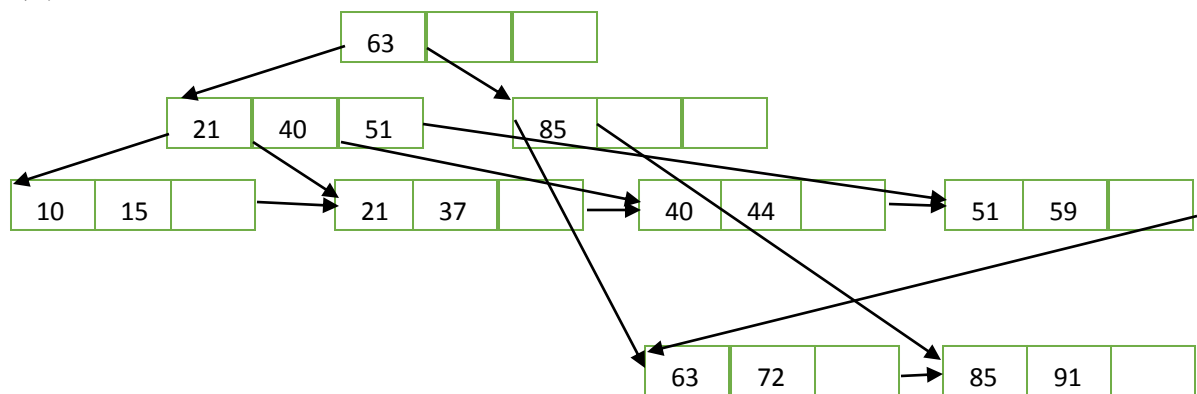
(2)



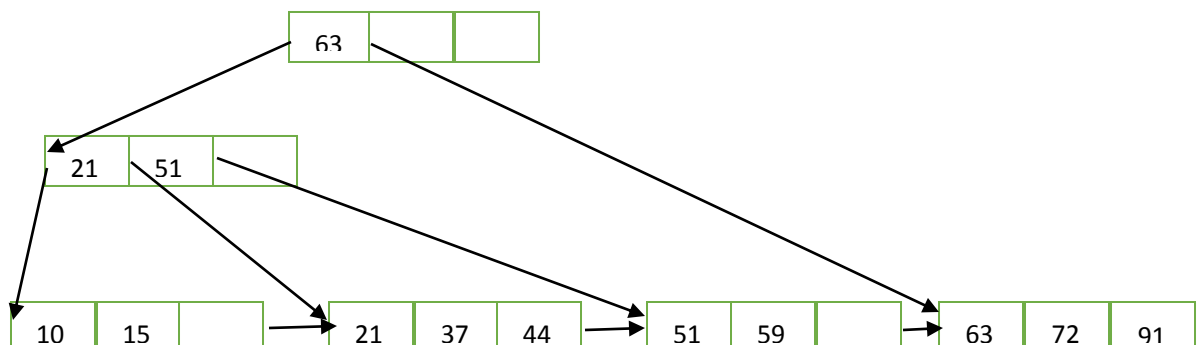
最后放入为 20



二、
(1)



(2)



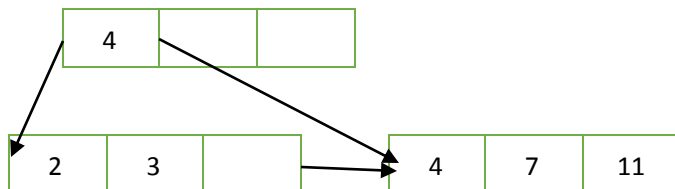
三、

(1)

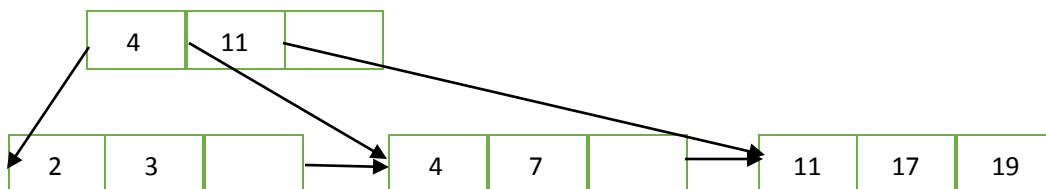
2, 3, 4



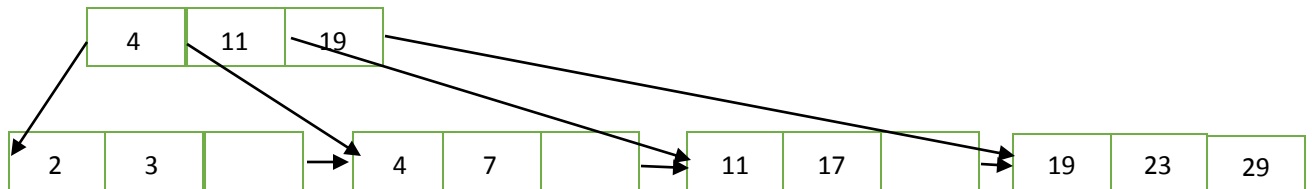
7,11



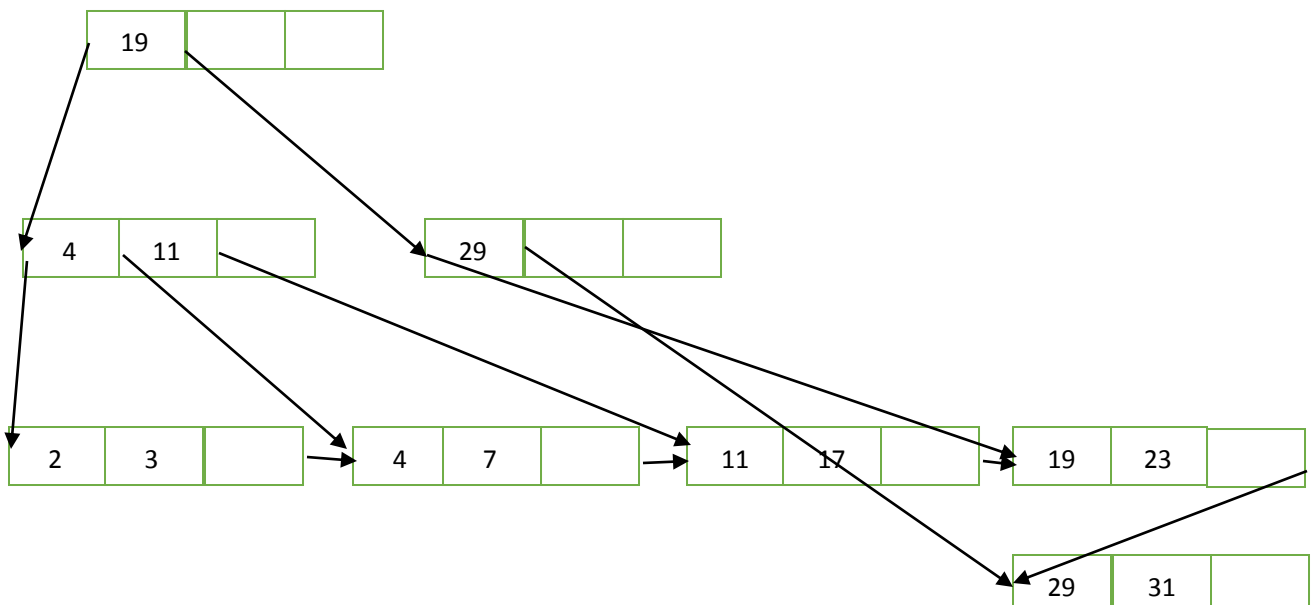
17,19



23,29



31

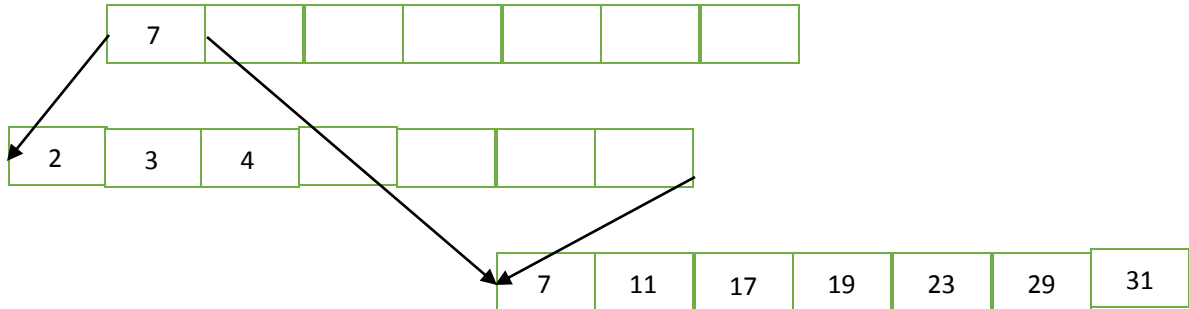


(2)

2, 3, 4, 7, 11, 17, 19

2	3	4	7	11	17	19
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23, 29, 31



四、

(1)

$V(A, r_1)=1000$, $V(C, r_2)=1500$, $V(E, r_3)=750$

$T(r_1 \bowtie r_2) = 1000 * 1500 / \max(1000, 1500) = 1000$

$T(r_1 \bowtie r_2 \bowtie r_3) = 1000 * 750 / \max(1000, 750) = 750$

(2)

$V(A, r_1)=1000$, $V(C, r_2)=1500$, $V(E, r_3)=750$

$T(r_1 \bowtie r_2) = 1000 * 1500 / \max(1000, 1000) = 1500$

$T(r_1 \bowtie r_2 \bowtie r_3) = 1500 * 750 / \max(1000, 750) = 1125$

五、

(a)

next-loop: $300/60+(300/60)/10*100=550$

Sort-merge: $100*10+50+100=350$

(b)

无索引:

Next-loop: $100+50/10*1=105$

Sort-merge: $100+50/10=105$

有索引:

Next0loop: $1+50/10=6$

Sort-merge: $1+50/10=6$

(c)

无索引:

Next-loop: $50/10+50/10+100=110$

Sort-merge: $50/10+50/10+100=110$

有索引:

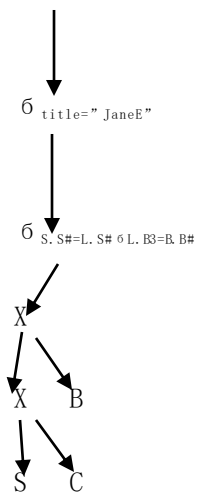
Next-loop: $50/10+1+50/10=11$

Sort-merge: $50/10+1+50/10=11$

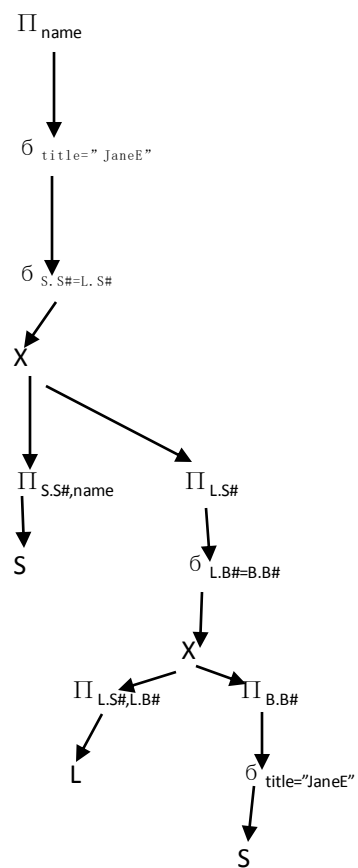
(2)

(a)

优化前：

$$\Pi_{\text{name}}(\sigma_{\text{title}=\text{"JoneE"}}(S \bowtie L \bowtie B))$$
 Π_{name} 

优化后:

$$\Pi_{\text{name}}(\Pi_{\text{S.s\#,name(S)}} \bowtie \Pi_{\text{L.S\#,L.B\#}}(\sigma_{\text{title="JaneE"}}))$$


(b)

$$V(S, S\#)=1000, V(L, S\#)=10000, V(L, B\#)=10000, V(B, B\#)=2000$$

Pre:

$$T(B \bowtie L \bowtie S) = 10000 * 2000 / \max(1000, 2000) = 10000$$

Post:

$$T(B \bowtie L \bowtie S) = 10000 * 2000 / \max(10000, 2000) = 2000$$