Architectures des Systèmes de Bases de Données

External Sort Merge
SORT MERGE RUNS

2 way Sort Merge

Passe 0

Passe 1

1 page runs

Passe 2

2 pages runs

4 pages runs

Passe 3

8 pages runs

Passe 4
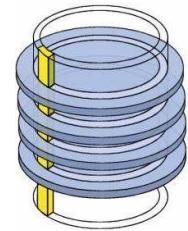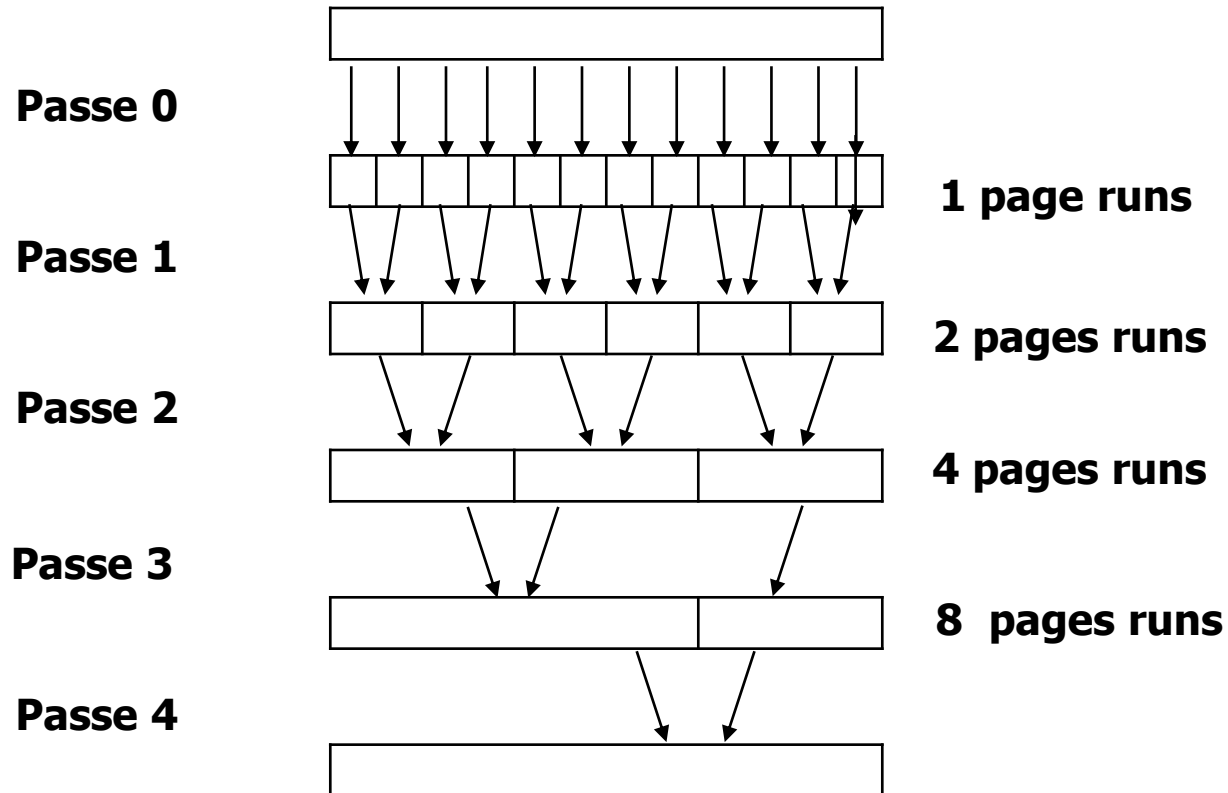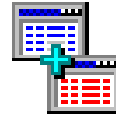
Pass 0 : 1 block Run index (0..9)

S0	S1	S2	S3
9 ZE	9 YH	9 ZF	9 ZD
8 SA	8 UH	8 VF	8 XG
7 MD	7 UE	7 VC	7 RA
6 KA	6 RG	6 TF	6 OB
5 GE	5 NH	5 TE	5 ND
4 FF	4 LC	4 RB	4 LE
3 FD	3 JC	3 JE	3 IB
2 DC	2 JA	2 DG	2 EH
1 BE	1 IG	1 CA	1 EB
0 AC	0 BG	0 AE	0 AF

Pass0

Pass 1 : 2 blocks runs index (0..19)

Run 01

Run 02

S01.1

S01.2

S23.1

S23.2

S01.1		S01.2	
9	JC	19	ZE
8	JA	18	YH
7	IG	17	UH
6	GE	16	UE
5	FF	15	SA
4	FD	14	RG
3	DC	13	NH
2	BG	12	MD
1	BE	11	LC
0	AC	10	KA

S23.1		S23.2	
9	ND	19	ZF
8	LE	18	ZD
7	JE	17	XG
6	IB	16	VF
5	EH	15	VC
4	EB	14	TF
3	DG	13	TE
2	CA	12	RB
1	AF	11	RA
0	AE	10	OB

Pass1

Pass 2 : 4 block runs sorted index

S3.1		S3.2		S3.3		S3.4	
9	EH	19	LC	29	TE	39	ZF
8	EB	18	KA	28	SA	38	ZE
7	DG	17	JE	27	RG	37	ZD
6	DC	16	JC	26	RB	36	YH
5	CA	15	JA	25	RA	35	XG
4	BG	14	IG	24	OB	34	VF
3	BE	13	IB	23	NH	33	VC
2	AF	12	GE	22	ND	32	UH
1	AE	11	FF	21	MD	31	UE
0	AC	10	FD	20	LE	30	TF

Index Run

Pass2
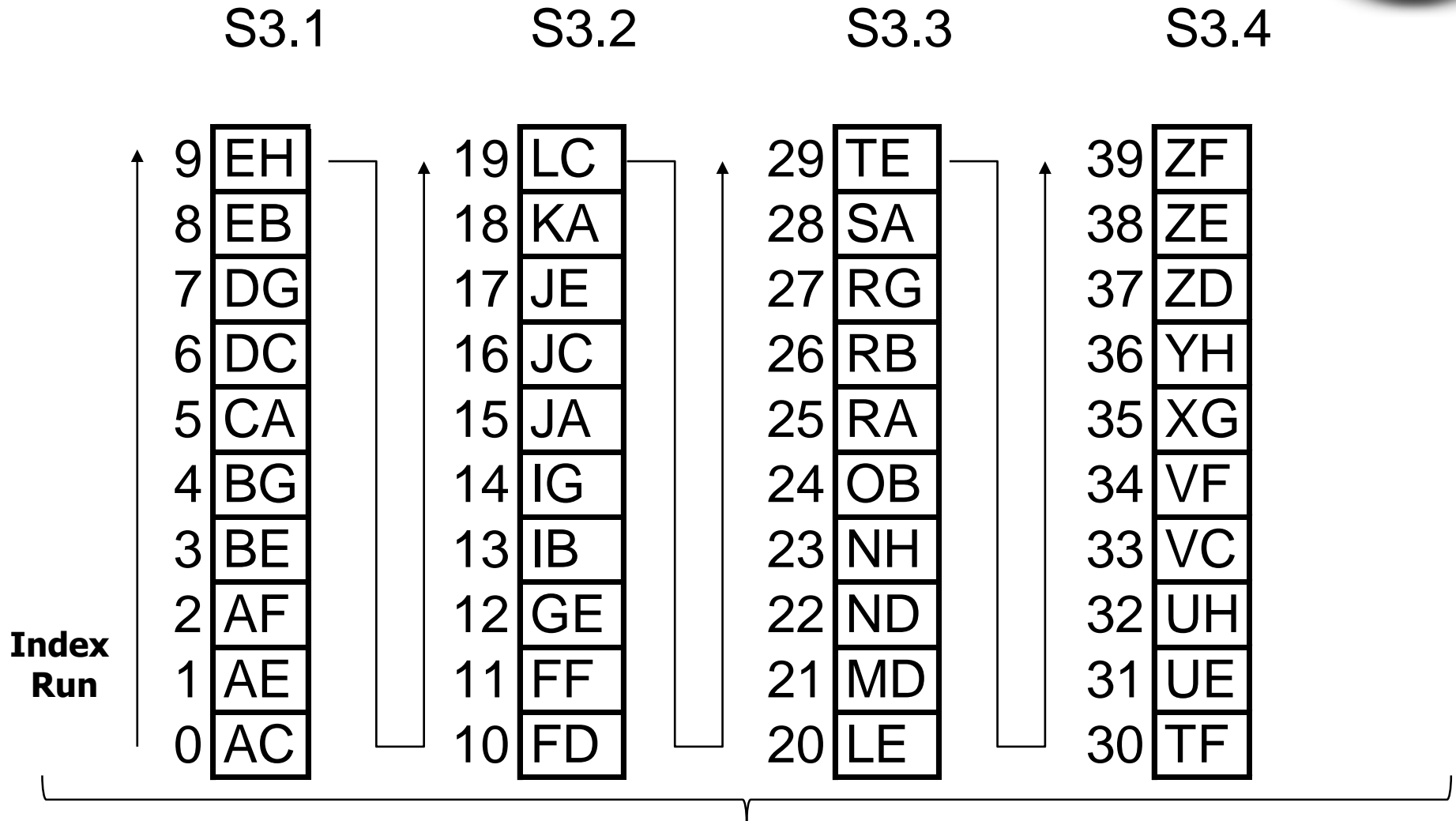
Overall
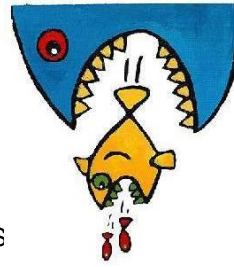
S0	S	S2	S3
9 ZE	9 YH	9 ZF	9 ZD
8 SA	8 UH	8 VF	8 XG
7 MD	7 UE	7 VC	7 RA
6 KA	6 RG	6 TF	6 OB
5 GE	5 NH	5 TE	5 ND
4 FF	4 LC	4 RB	4 LE
3 FD	3 JC	3 JE	3 IB
2 DC	2 JA	2 DG	2 EH
1 BE	1 IG	1 CA	1 EB
0 AC	0 BG	0 AE	0 AF

Pass 0

2 Blocks Run

S01.1	S01.2	S23.1	S23.2
9 JC	19 ZE	9 ND	19 ZF
8 JA	18 YH	8 LE	18 ZD
7 IG	17 UH	7 JE	17 XG
6 GE	16 UE	6 IB	16 VF
5 FF	15 SA	5 EH	15 VC
4 FD	14 RG	4 EB	14 TF
3 DC	13 NH	3 DG	13 TE
2 BG	12 MD	2 CA	12 RB
1 BE	11 LC	1 AF	11 RA
0 AC	10 KA	0 AE	10 OB

Pass 1

4 Blocks Run

S3.1	S3.2	S3.3	S3.4
9 EH	19 LC	29 TE	39 ZF
8 EB	18 KA	28 SA	38 ZE
7 DG	17 JE	27 RG	37 ZD
6 DC	16 JC	26 RB	36 YH
5 CA	15 JA	25 RA	35 XG
4 BG	14 IG	24 OB	34 VF
3 BE	13 IB	23 NH	33 VC
2 AF	12 GE	22 ND	32 UH
1 AE	11 FF	21 MD	31 UE
0 AC	10 FD	20 LE	30 TF

Pass 2

1 block Run index (0..9)

	0	1	2	3	4	5	6	7	8	9
S0	AC	BE	DC	FD	FF	GE	KA	MD	SA	ZE

	0	1	2	3	4	5	6	7	8	9
S1	BG	IG	JA	JC	LC	NH	RG	UE	UH	YH

	0	1	2	3	4	5	6	7	8	9
S2	AE	CA	DG	JE	RB	TE	TF	VC	VF	ZF

	0	1	2	3	4	5	6	7	8	9
S3	AF	EB	EH	IB	LE	ND	OB	RA	XG	ZD

2 blocks runs index (0..19)

Index runs

	0	1	2	3	4	5	6	7	8	9
S01.1	AC	BE	BG	DC	FD	FF	GE	IG	JA	JC

	10	11	12	13	14	15	16	17	18	19
S01.2	KA	LC	MD	NH	RG	SA	UE	UH	YH	ZE

	0	1	2	3	4	5	6	7	8	9
S23.1	AE	AF	CA	DG	EB	EH	IB	JE	LE	ND

	10	11	12	13	14	15	16	17	18	19
S23.2	OB	RA	RB	TE	TF	VC	VF	XG	ZD	ZF
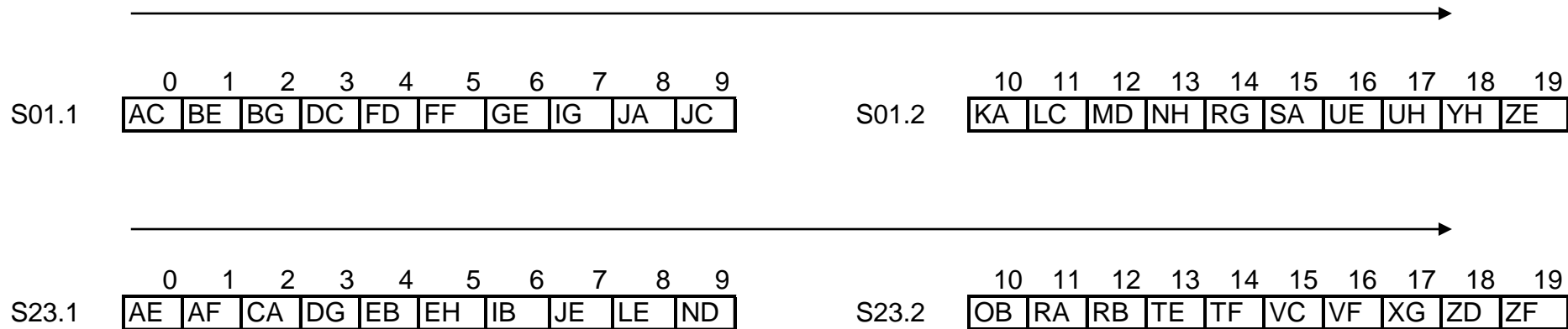
4 Blocks runs index (0..39)

Index runs

S3.1

ZF	ZE	ZD	YH	XG	VF	VC	UH	UE	TF
0	1	2	3	4	5	6	7	8	9

S3.2

TE	SA	RG	RB	RA	OB	NH	ND	MD	LE
10	11	12	13	14	15	16	17	18	19

S3.3

LC	KA	JE	JC	JA	IG	IB	GE	FF	FD
20	21	22	23	24	25	26	27	28	29

S3.4

EH	EB	DG	DC	CA	BG	BE	AF	AE	AC
30	31	32	33	34	35	36	37	38	39
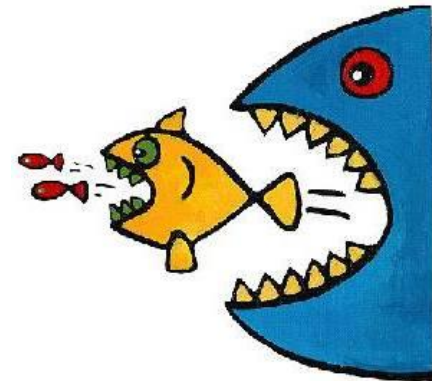
Over all

S0
0	1	2	3	4	5	6	7	8	9
AC	BE	DC	FD	FF	GE	KA	MD	SA	ZE

S1
0	1	2	3	4	5	6	7	8	9
BG	IG	JA	JC	LC	NH	RG	UE	UH	YH

S01.1
0	1	2	3	4	5	6	7	8	9
AC	BE	BG	DC	FD	FF	GE	IG	JA	JC

S01.2
10	11	12	13	14	15	16	17	18	19
KA	LC	MD	NH	RG	SA	UE	UH	YH	ZE

S2
0	1	2	3	4	5	6	7	8	9
AE	CA	DG	JE	RB	TE	TF	VC	VF	ZF

S23.1
0	1	2	3	4	5	6	7	8	9
AE	AF	CA	DG	EB	EH	IB	JE	LE	ND

S23.2
10	11	12	13	14	15	16	17	18	19
OB	RA	RB	TE	TF	VC	VF	XG	ZD	ZF

S3
0	1	2	3	4	5	6	7	8	9
AF	EB	EH	IB	LE	ND	OB	RA	XG	ZD

S3.1 ... S3.2 ... S3.3 ... S3.4
ZF	ZE	ZD	YH	XG	VF	VC	UH	UE	TF	TE	SA	RG	RB	RA	OB	NH	ND	MD	LE	LC	KA	JE	JC	JA	IG	IB	GE	FF	FD	EH	EB	DG	DC	CA	BG	BE	AF	AE	AC
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39

1 Block Run   **2 Blocks Run**   **4 Blocks Run**