

\sim	
T	F
F	T

\wedge	
TT	T
TF	F
FT	F
FF	F

\vee	
TT	T
TF	T
FT	T
FF	F

Charles
Jaworski

\Rightarrow	
TT	T
TF	T
FT	F
FF	T

\Leftrightarrow	
TT	T
TF	F
FT	F
FF	T

$$P \Rightarrow Q \Rightarrow R \Rightarrow S$$

a: each element swapped
n times

b: each subsequent elem.
swapped $n-1 > 3$
times

c: the protocol of
three is completed

d: the protocol of
two is completed

e: the algorithm is
complete

a_2 : not including in
the subsequent swap
the same element

$$(a \Leftrightarrow b) \wedge (c \wedge d) \Leftrightarrow e$$

$$(a \Leftrightarrow a_2 \Leftrightarrow b \wedge c \vee d) \Rightarrow e$$

A_1

--	--	--	--

A_2

--	--	--	--

1234, 2134, 3214, 4231
1324, 3124, 2314, 2431,
1432, 2143, 4213, 3241,
1423, 3142, 4312, 2341,
1342, 4132, ~~3214~~, 4231,
1243, 4123, 2413,
3412, 4321,

Charles
Zuscovitz

ABCO

A_1

--	--

A_2

--	--

1. $A_1[0] = A_1[1]$

2. $A_2[0] = A_2[0]$

A_1

--	--	--

A_2

--	--	--

123, 132, 321

213, 312

123, 213, 321

132, 231, 312

1. $A_1[0] = A_1[0]$

2. $A_2[0] = A_1[1]$

3. $A_1[0] = A_1[2]$

→ 4. $A_1[2] = A_1[1]$

→ 5. $A_1[2] = A_2[1]$

→ 6. $A_2[2] = A_2[1]$

Charles Leiserson

Algorithm Design