

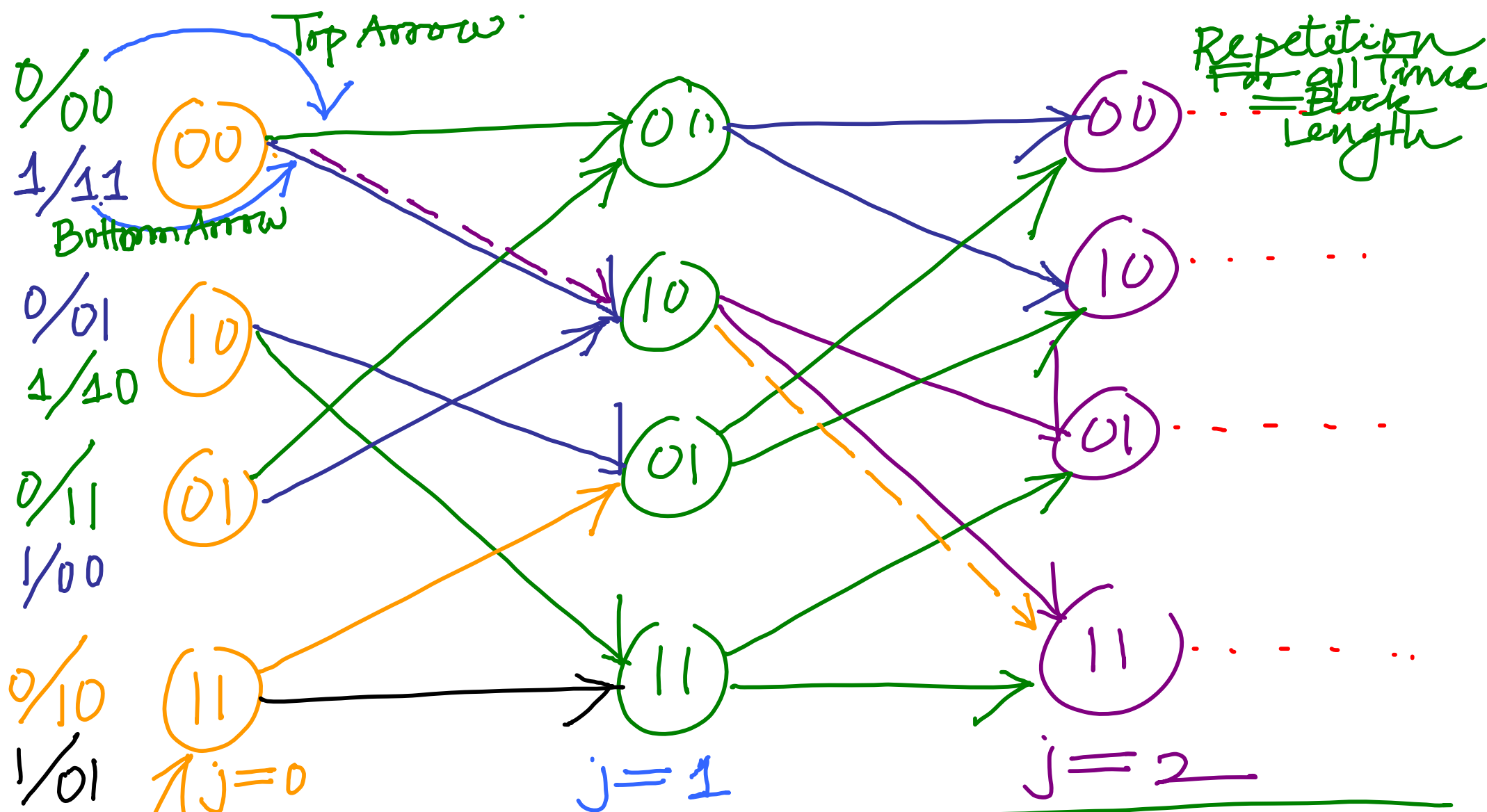
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TRELLIS

Trellis based representation
of convolutional code

Derived From
State Diagram
Representation of
the convolutional code.

Trellis — Explicitly shows the
Time Evolution of
the convolutional code.



TRELLIS

Possible States at $j=0$

Time Evolution of the convolutional code

- All possible states at each time instant
- Time Evolution from j to $j+1$

↓
Unfolding of
State Diagram

+ Repetition at various
Time instants.

OBSERVE: Any code sequence
corresponds to a path
on the Trellis.

EX: Consider the state sequence

	$j=0$	$j=1$	$j=2$	
State:	00	10	11	...
Code words:		10	...	...

State Transitions.

However, observe,

State: $00 \rightarrow 11 \rightarrow 10 \dots$

NOT a legitimate path.

No transition from
 $00 \rightarrow 11$

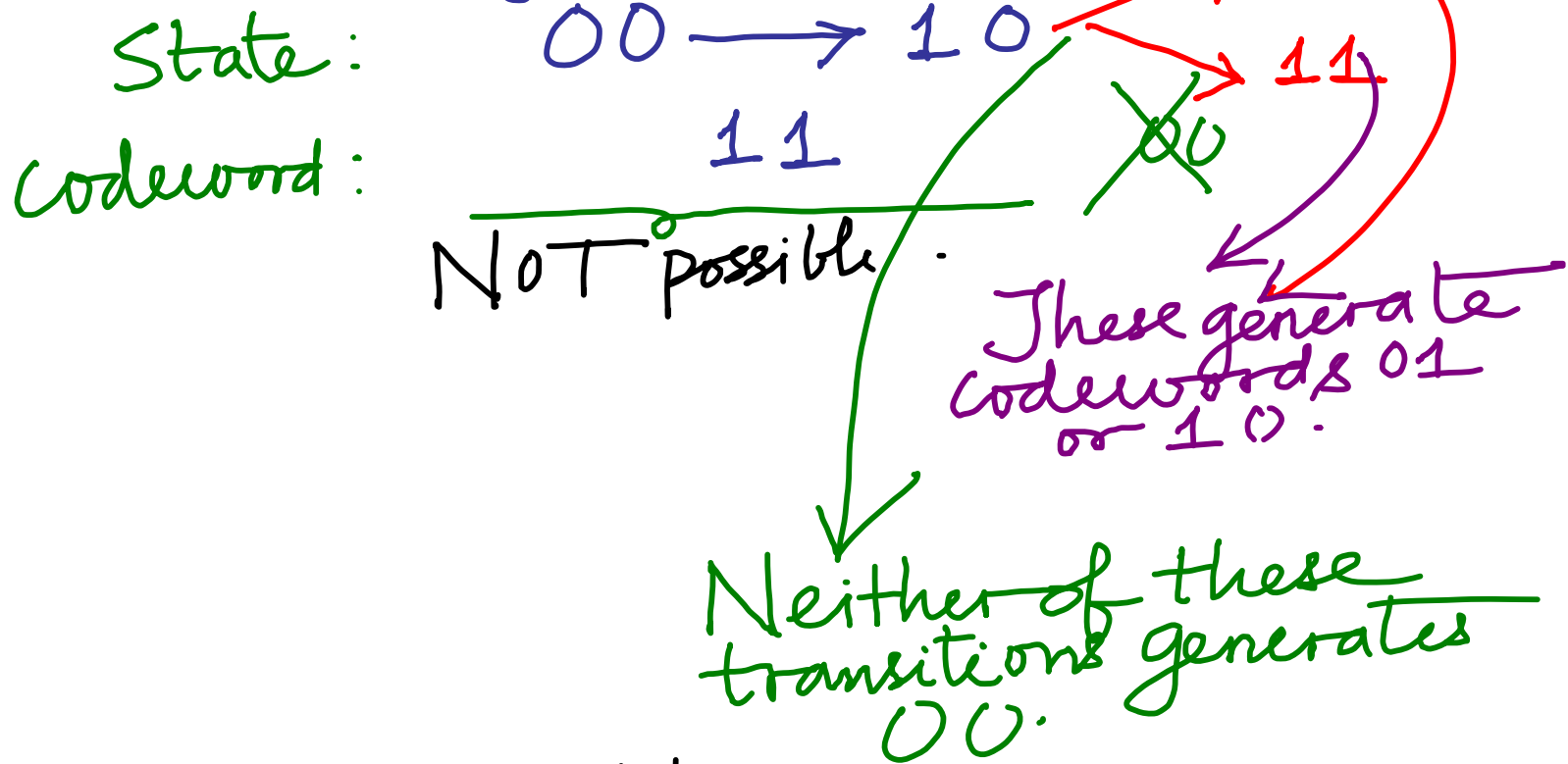
Cannot correspond to
any codeword.

Similarly,

$11 \ 00 \ 10$

NOT a legitimate codeword.

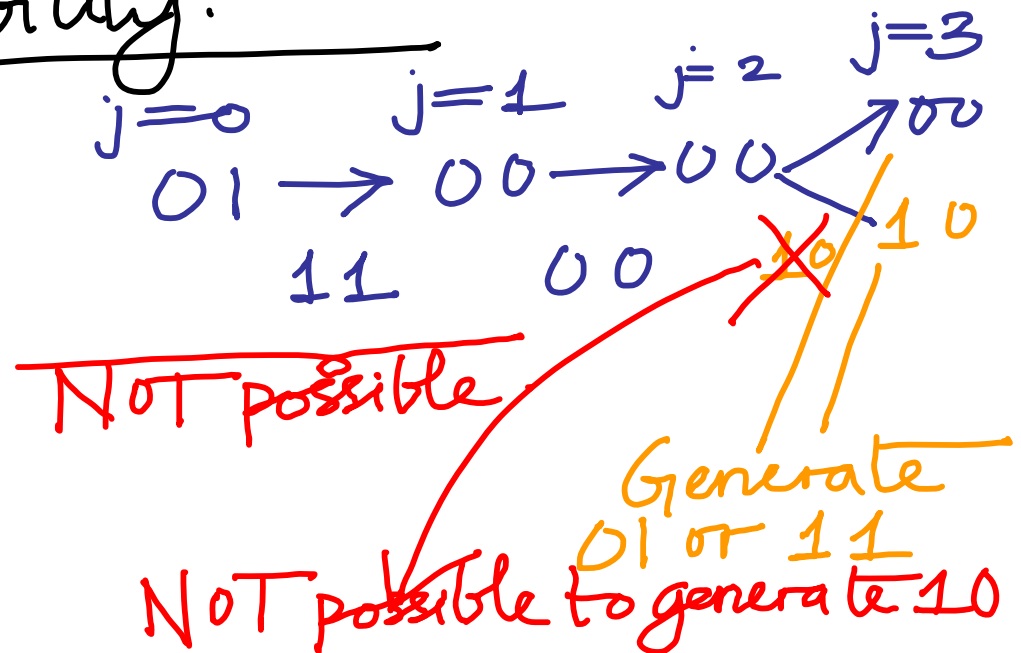
$j=2$



Other Possibility:

State: $j=0$ $01 \rightarrow j=1$ $00 \rightarrow j=2$ $00 \rightarrow j=3$ 00

codeword: 11 00



Therefore, codeword sequence,

11 00 10

Does NOT correspond
to a valid codeword.

Decoding of convolutional code
at the receiver

⇓
Find input information bit
sequence.

⇓
Find a corresponding path through
Trellis.