

Construct a Turing machine that accepts the language:

$$L(M) = \{a^i b^j c^{i \times j} \mid i, j \geq 0\}$$

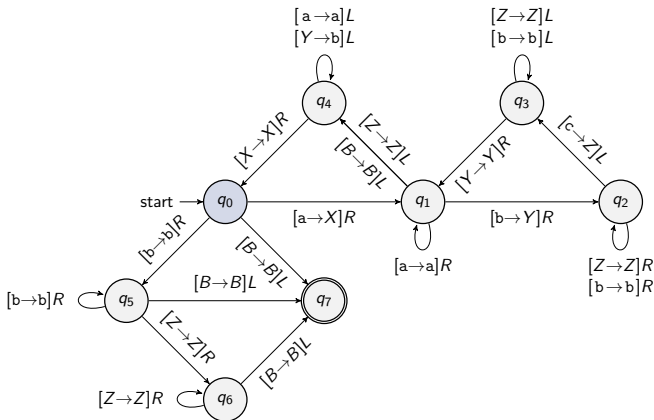
...	B	a	a	b	b	c	c	c	c	B	...
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- 1: **while** there are a's **do**
- 2: Find and Replace a with X
- 3: **while** there are b's **do**
- 4: Find and Replace b with Y
- 5: Find and Replace c with Z
- 6: **end while**
- 7: Roll back all Y's to b's
- 8: **end while**
- 9: Check if only b's and Z's are left

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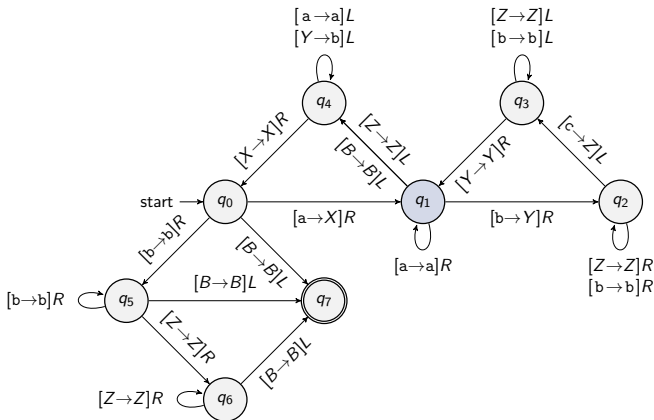


Find and Replace a with X.

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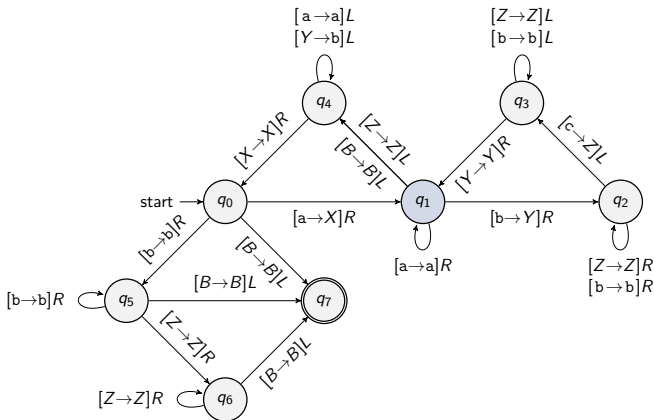


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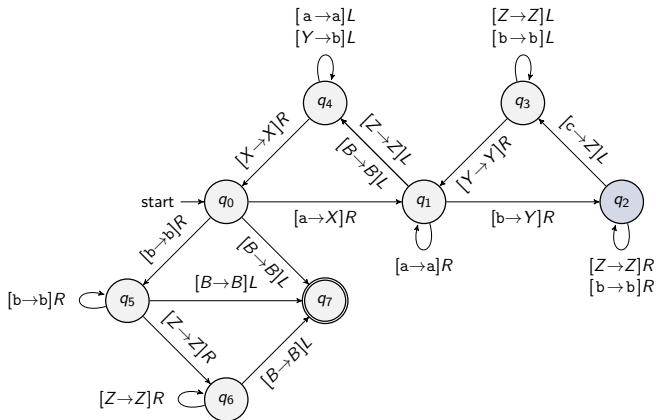
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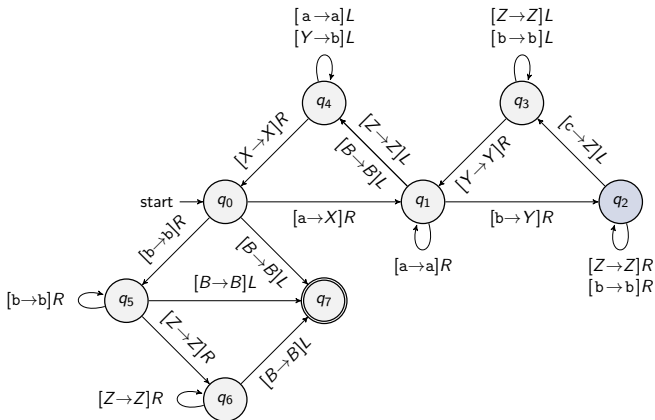
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Find and Replace c with Z.

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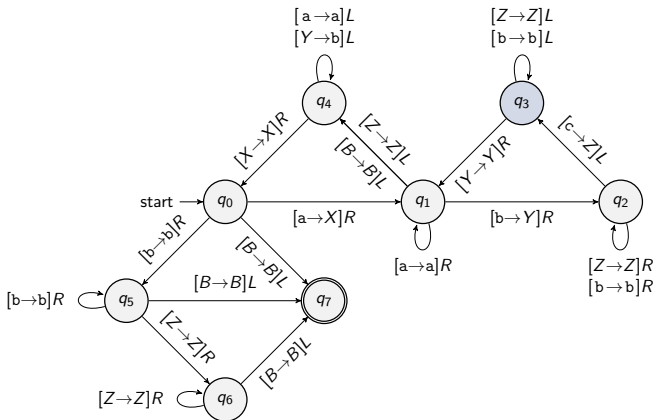
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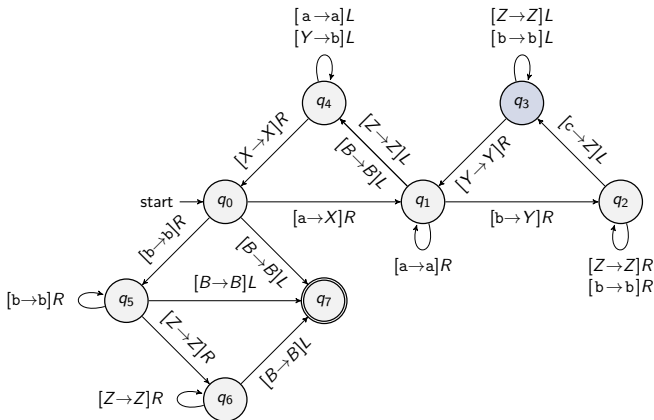
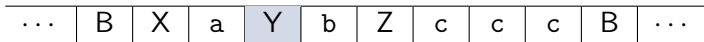
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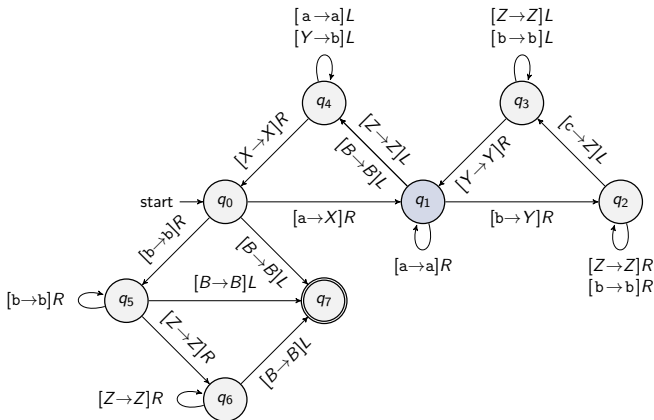
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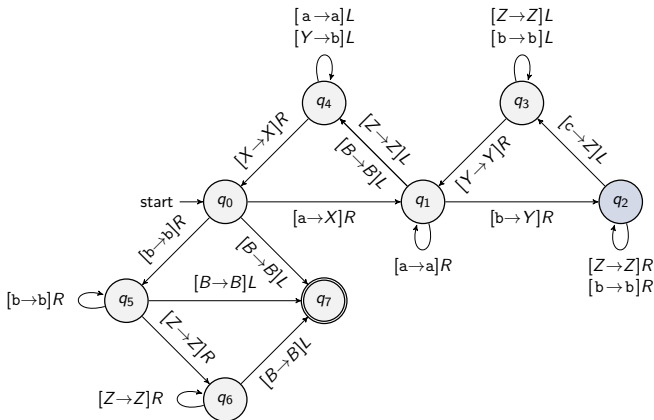


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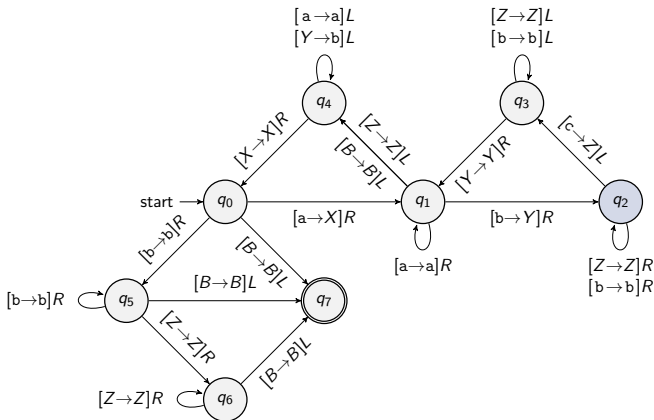
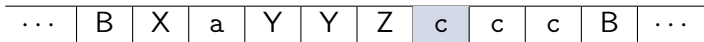
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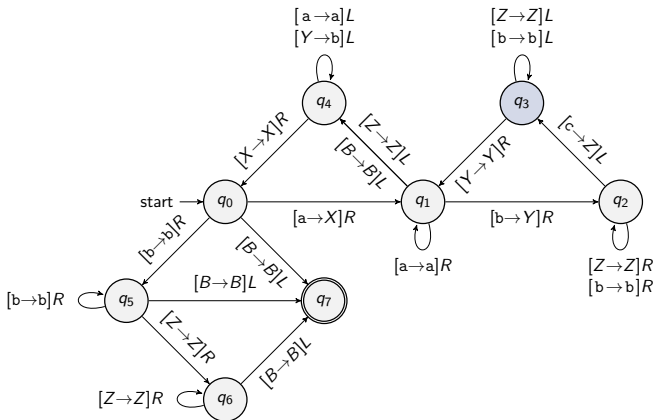
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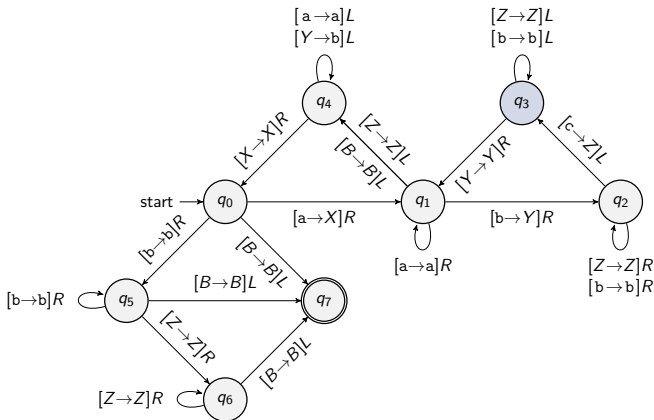
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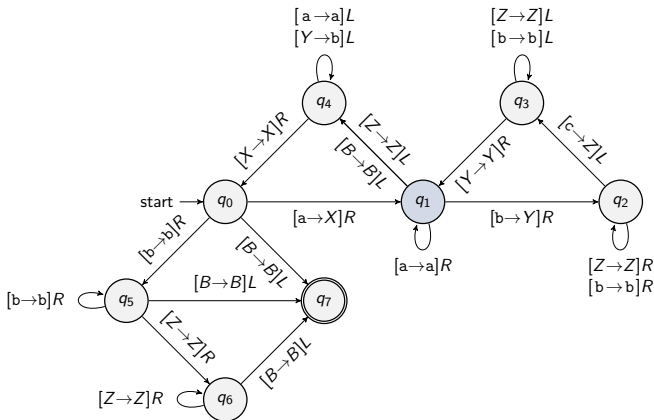
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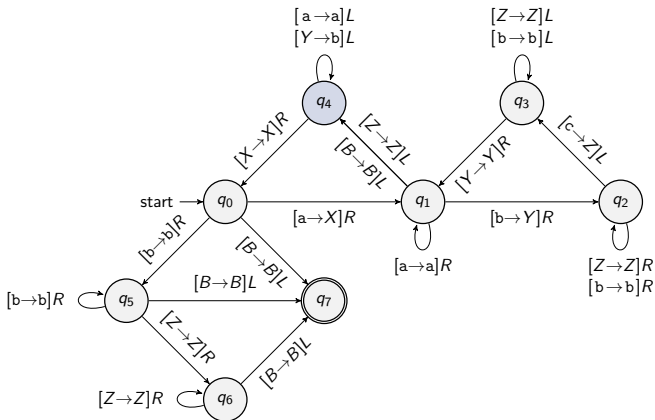


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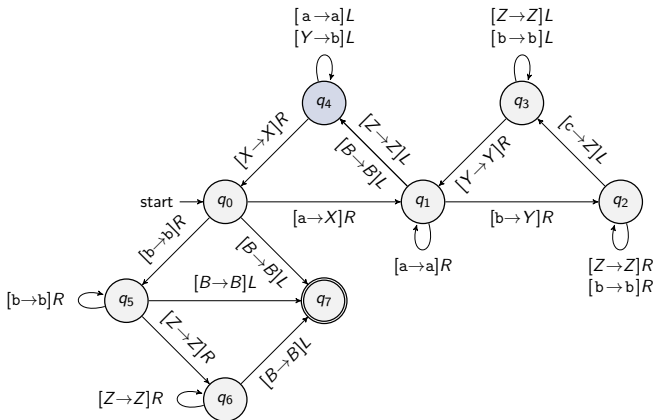
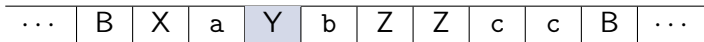
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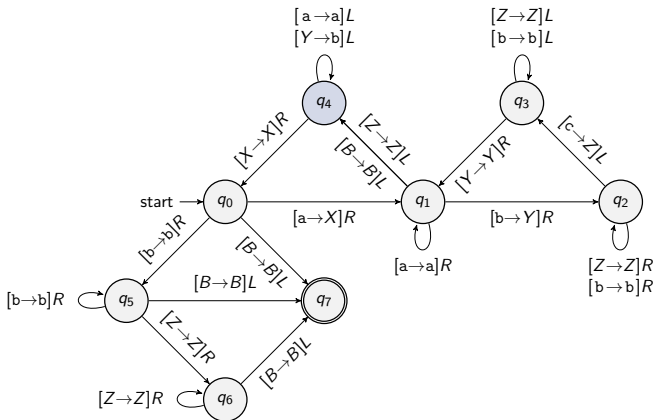
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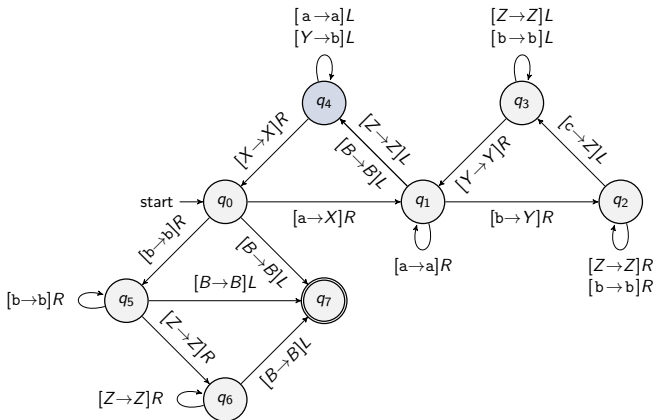
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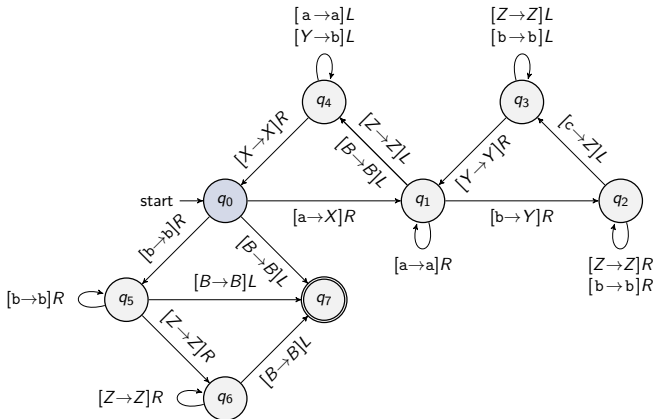
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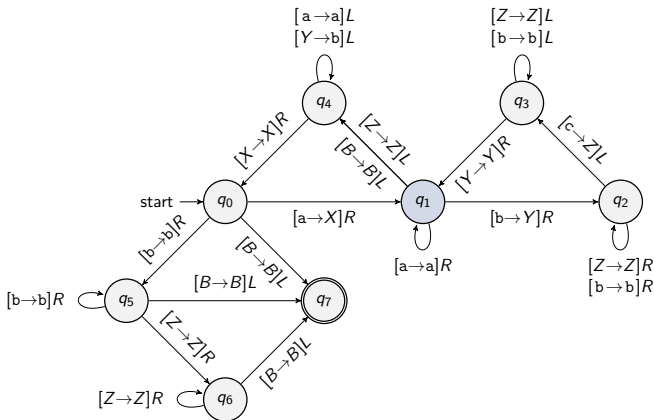


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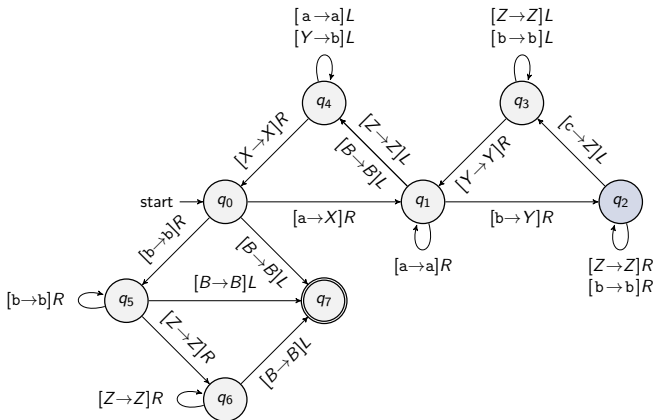
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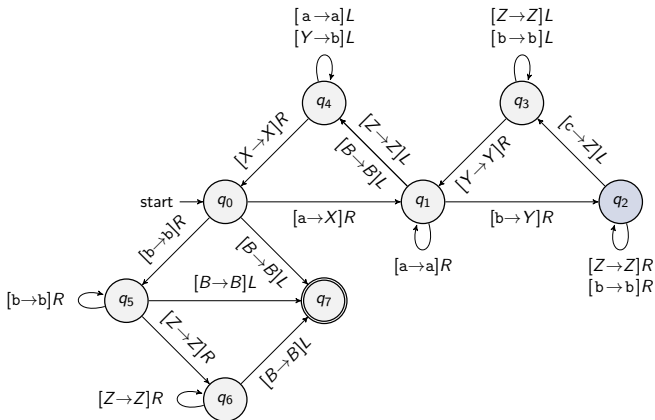
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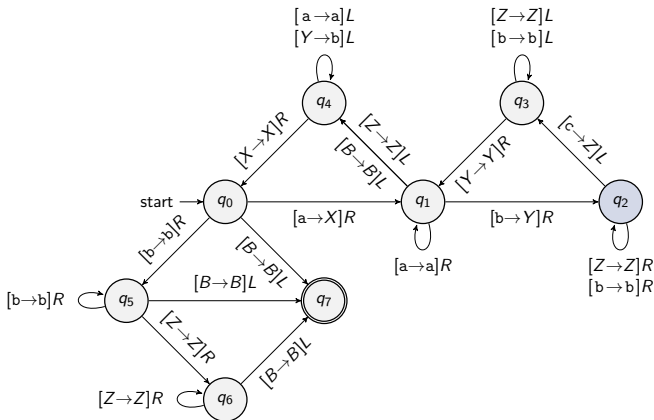
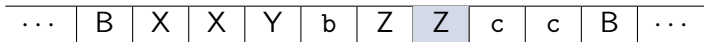
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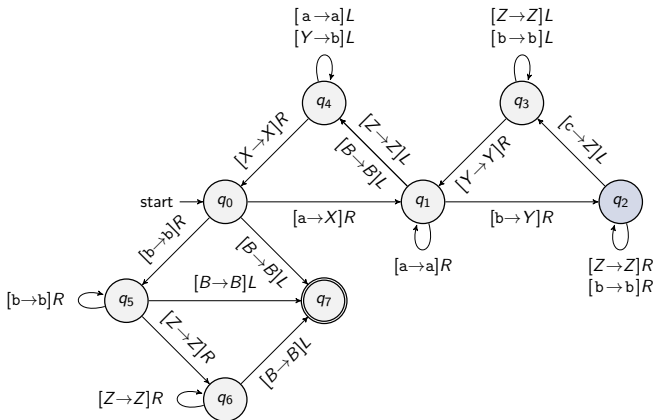
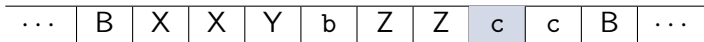
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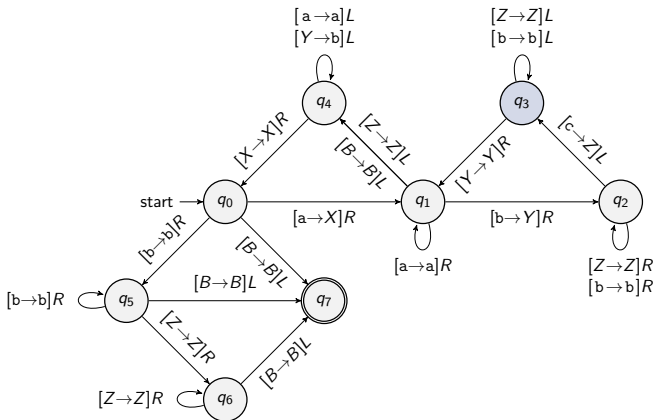
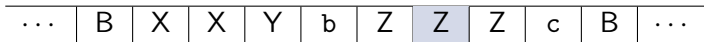
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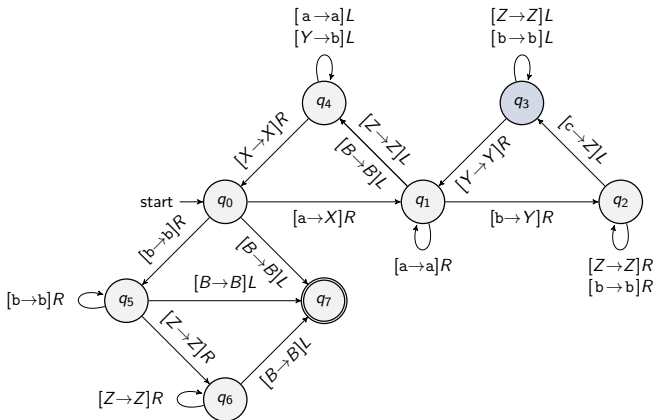
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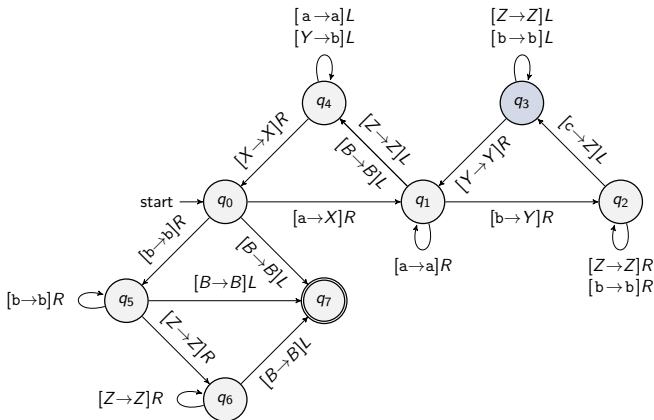
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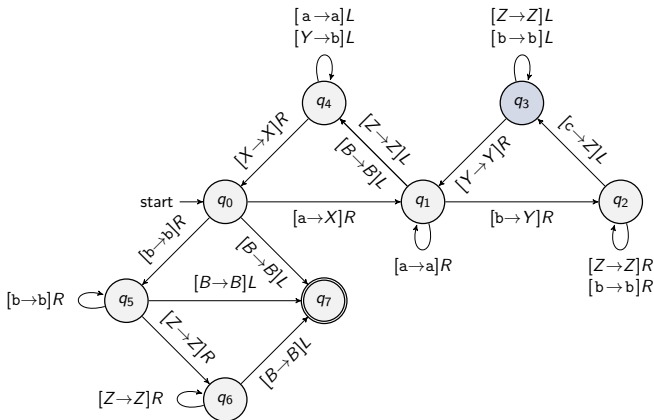


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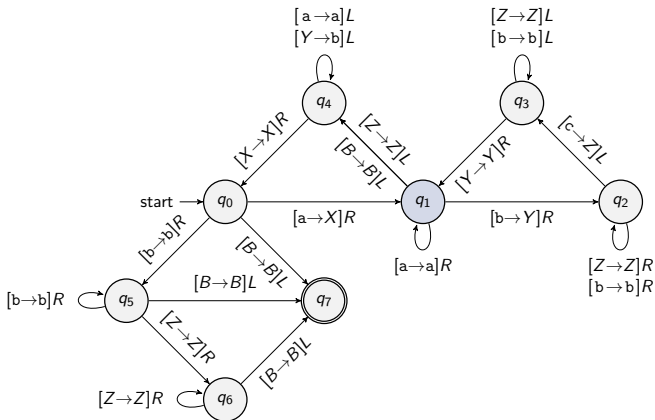
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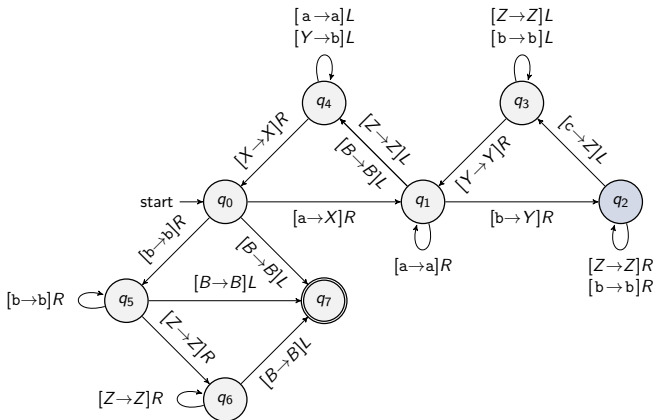
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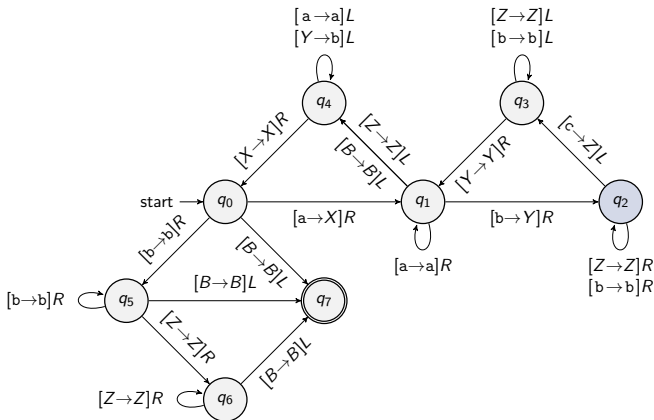
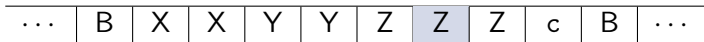
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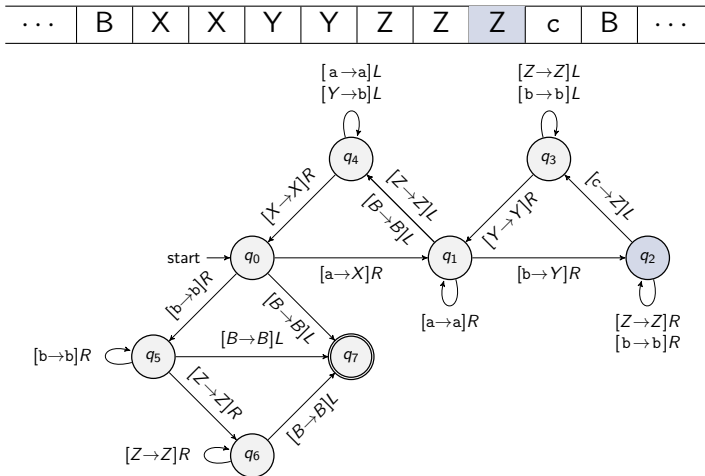
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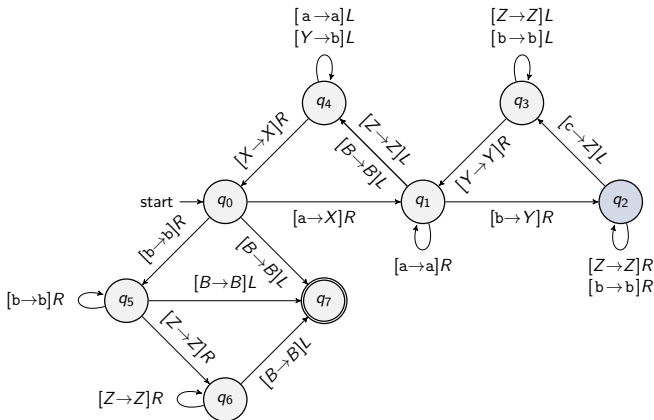
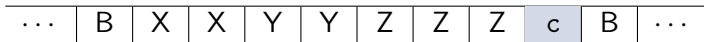
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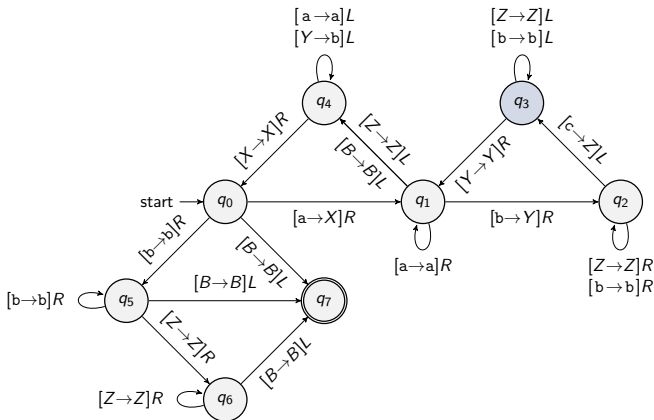
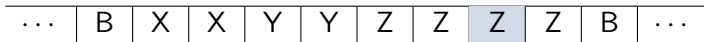
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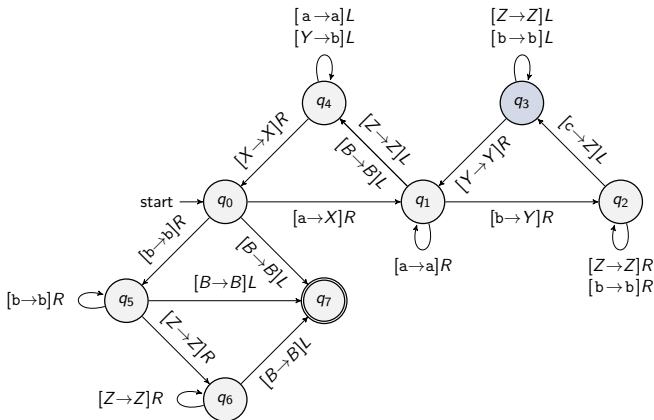
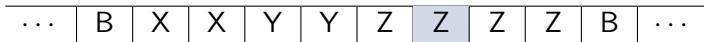
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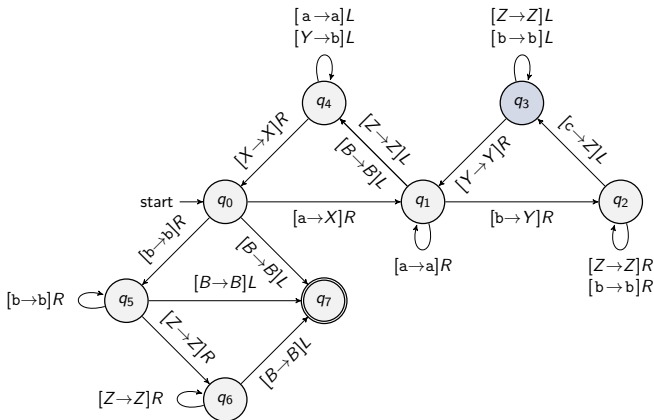
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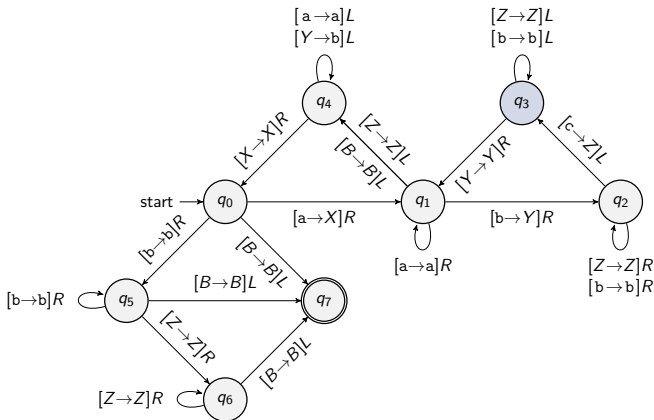
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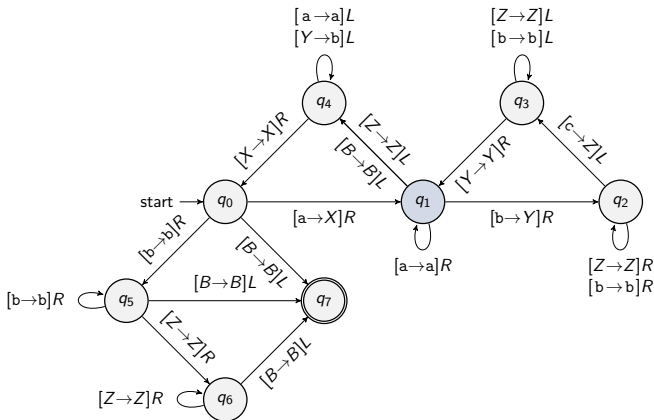
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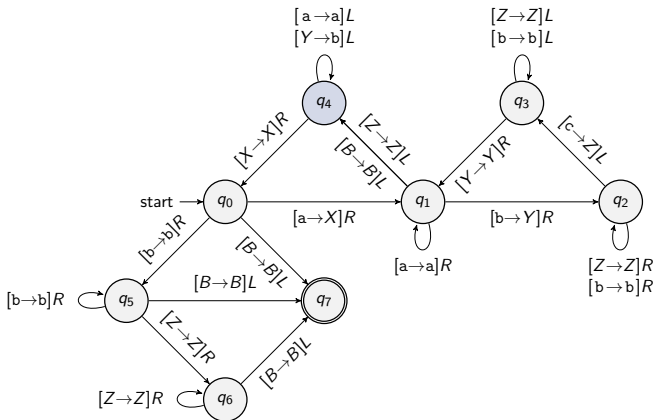
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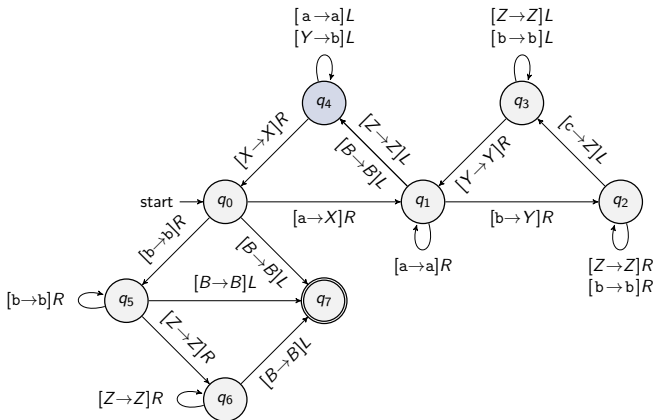
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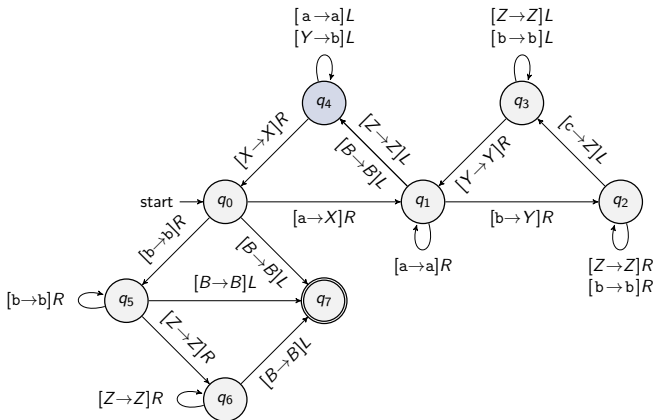
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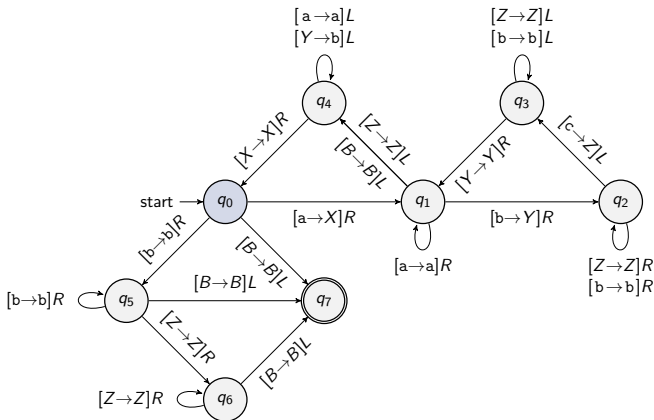
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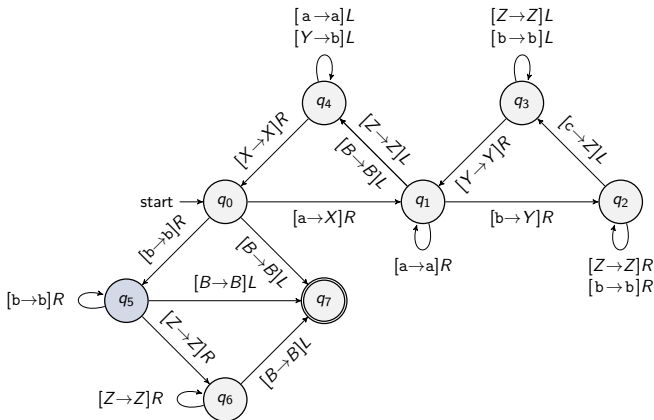


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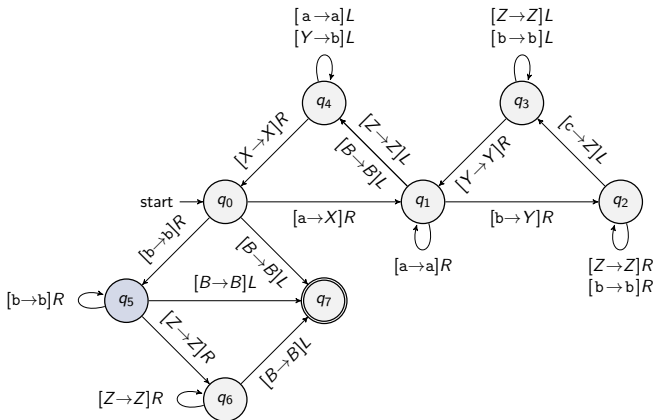
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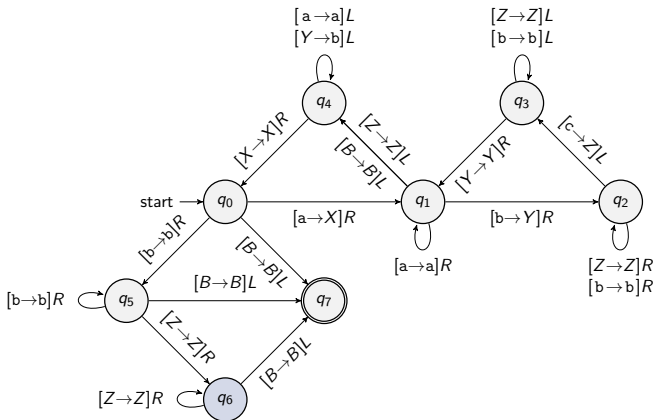
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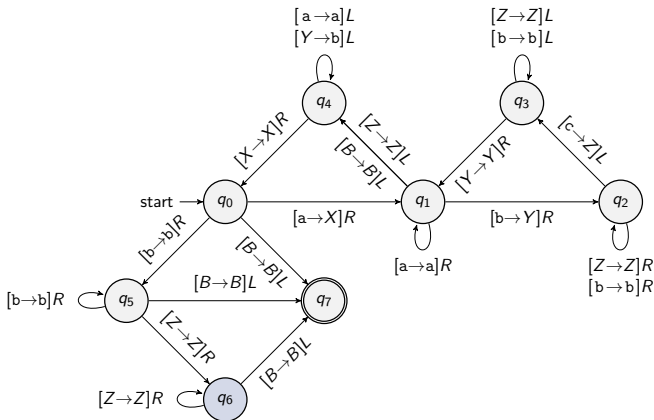
...	B	X	X	b	b	Z	Z	Z	Z	B	...
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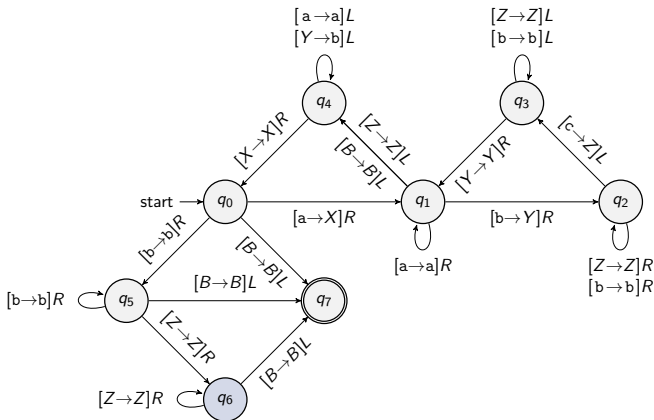
...	B	X	X	b	b	Z	Z	Z	Z	B	...
-----	---	---	---	---	---	---	---	---	---	---	-----



Construct a Turing machine that accepts the language:

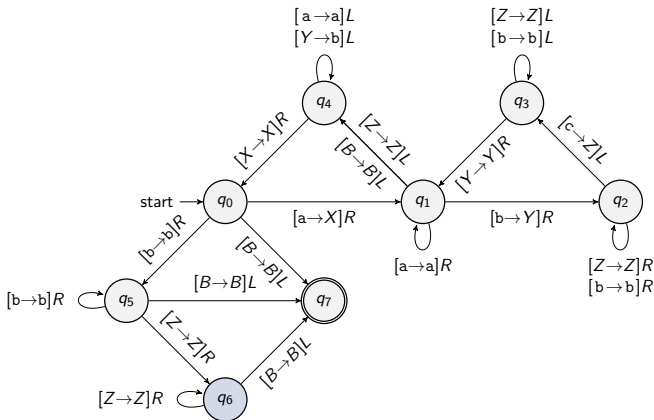
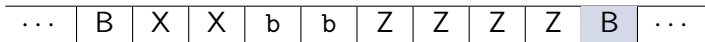
$$L(M) = \{a^i b^j c^{i \times j} \mid i, j \geq 0\}$$

...	B	X	X	b	b	Z	Z	Z	Z	B	...
-----	---	---	---	---	---	---	---	---	---	---	-----



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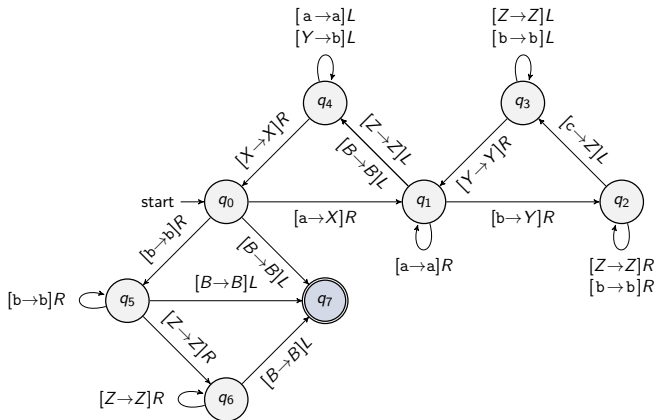
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-----	---	---	---	---	---	---	---	---	---	---	-----



Accept!