

Construct a Turing machine that accepts the language:

$$L(M) = \{a^n b^n c^n \mid n \geq 0\}$$

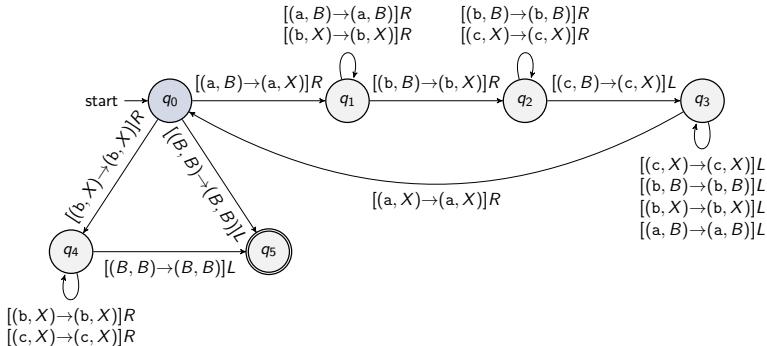
...	B	a	a	b	b	c	c	B	...
...	B	B	B	B	B	B	B	B	...

- 1: **while** there are unmarked a's **do**
- 2: Mark the first unmarked a with X
- 3: Mark the first unmarked b with X
- 4: Mark the first unmarked c with X
- 5: **end while**
- 6: Check if all symbols are marked

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...	B	a	a	b	b	c	c	B	...
...	B	B	B	B	B	B	B	B	...

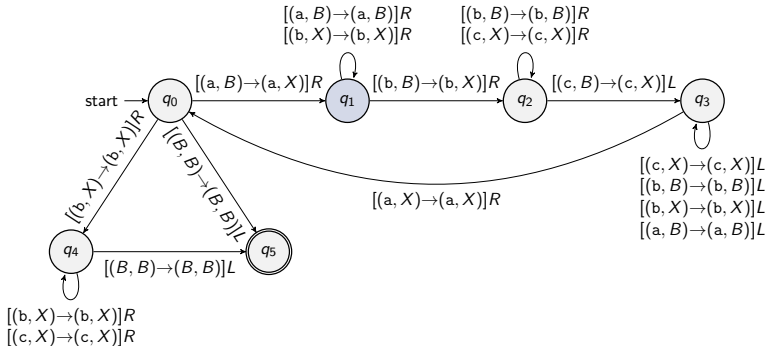


Mark the first unmarked a with X.

Construct a Turing machine that accepts the language:

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...	B	a	a	b	b	c	c	B	...
...	B	X	B	B	B	B	B	B	...

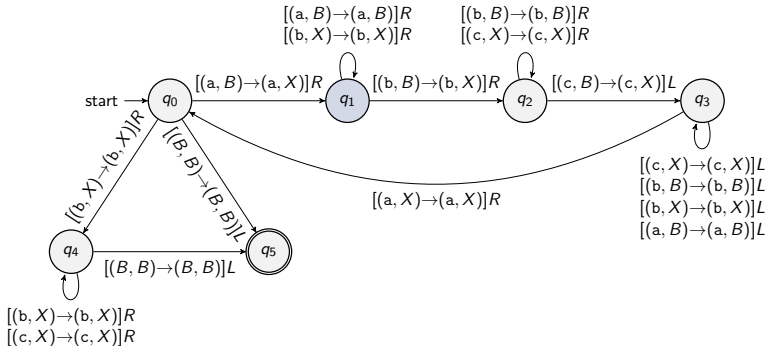


Mark the first unmarked b with X.

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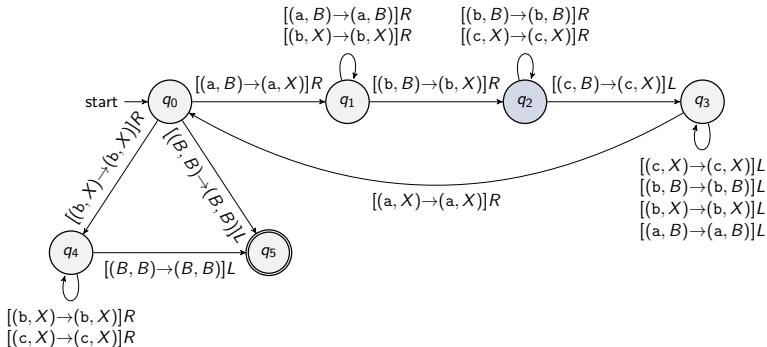
...	B	a	a	b	b	c	c	B	...
...	B	X	B	B	B	B	B	B	...



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...	B	a	a	b	b	c	c	B	...
...	B	X	B	X	B	B	B	B	...

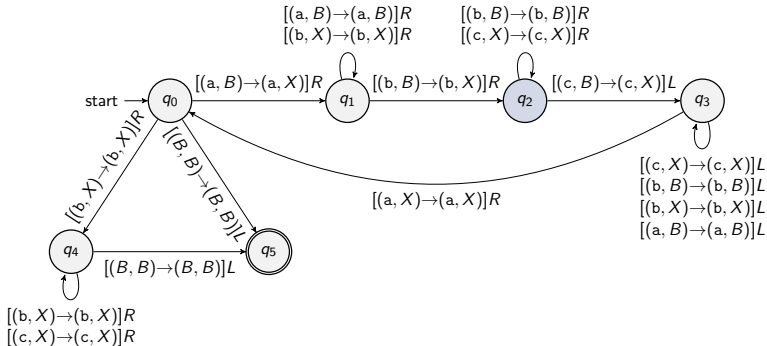


Mark the first unmarked c with X.

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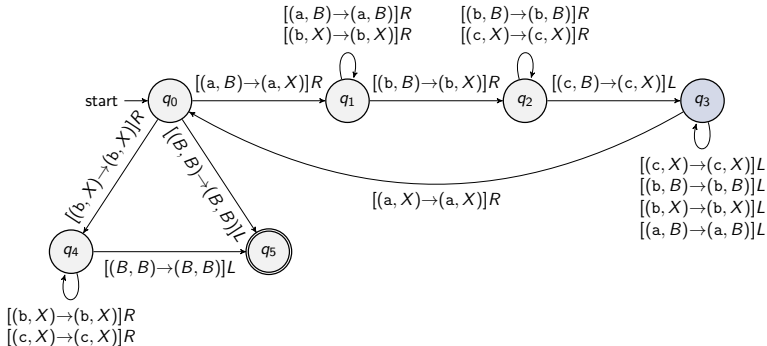
...	B	a	a	b	b	c	c	B	...
...	B	X	B	X	B	B	B	B	...



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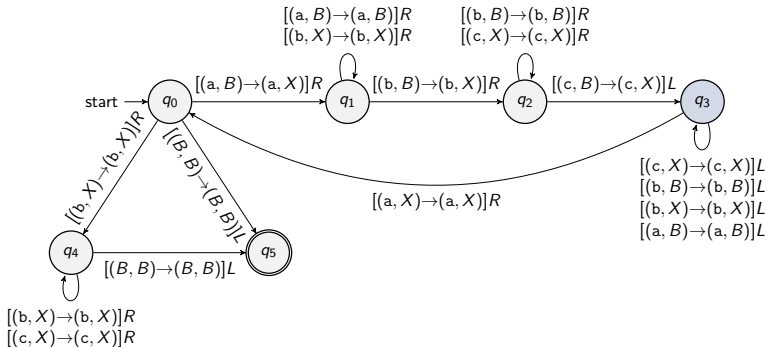
...	B	a	a	b	b	c	c	B	...
...	B	X	B	X	B	X	B	B	...



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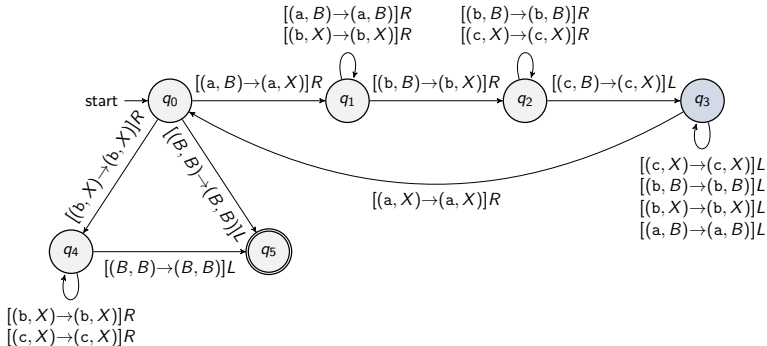
...	B	a	a	b	b	c	c	B	...
...	B	X	B	X	B	X	B	B	...



Construct a Turing machine that accepts the language:

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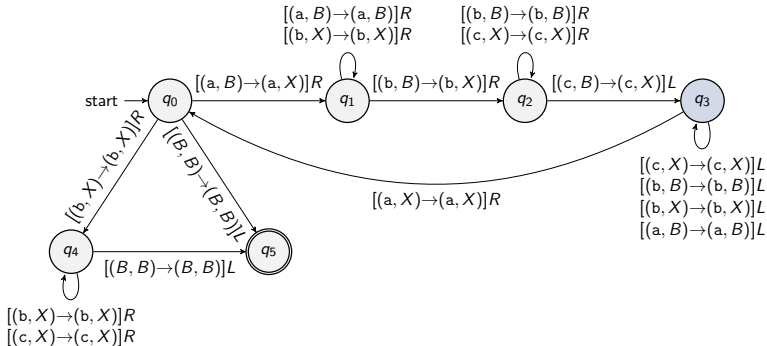
...	B	a	a	b	b	c	c	B	...
...	B	X	B	X	B	X	B	B	...



Construct a Turing machine that accepts the language:

$$L(M) = \{a^n b^n c^n \mid n \geq 0\}$$

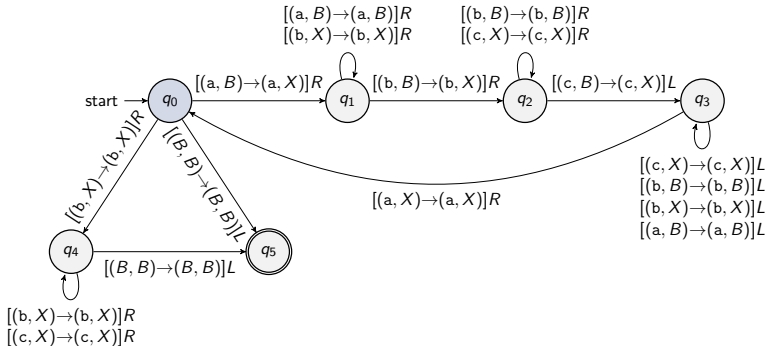
...	B	a	a	b	b	c	c	B	...
...	B	X	B	X	B	X	B	B	...



Construct a Turing machine that accepts the language:

$$L(M) = \{a^n b^n c^n \mid n \geq 0\}$$

...	B	a	a	b	b	c	c	B	...
...	B	X	B	X	B	X	B	B	...

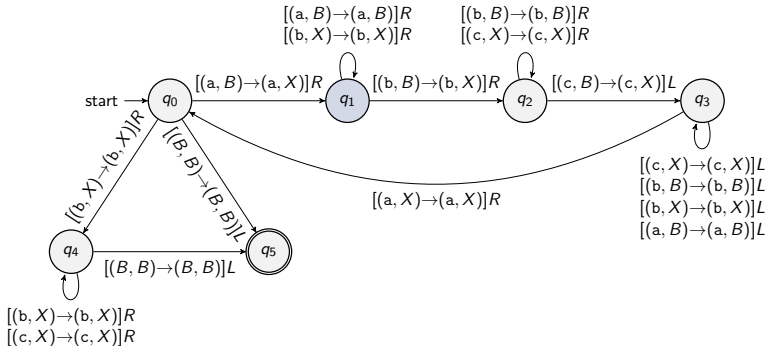


Repeat until all a's are marked.

Construct a Turing machine that accepts the language:

$$L(M) = \{a^n b^n c^n \mid n \geq 0\}$$

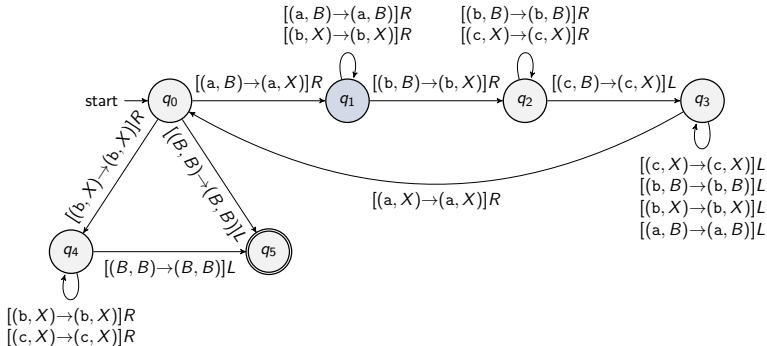
...	B	a	a	b	b	c	c	B	...
...	B	X	X	X	B	X	B	B	...



Construct a Turing machine that accepts the language:

$$L(M) = \{a^n b^n c^n \mid n \geq 0\}$$

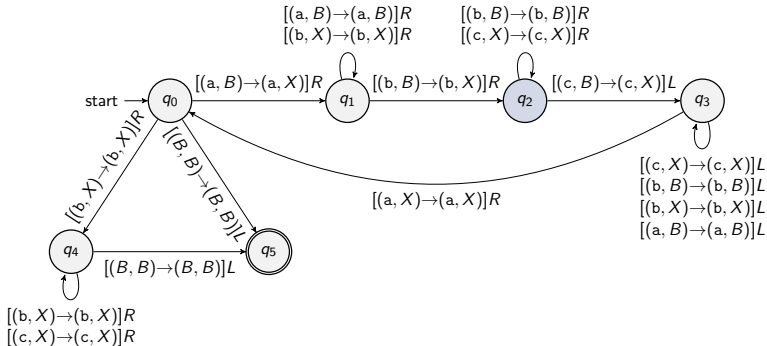
...	B	a	a	b	b	c	c	B	...
...	B	X	X	X	B	X	B	B	...



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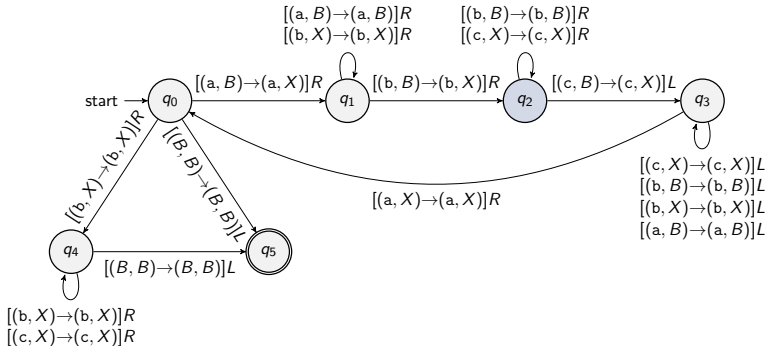
...	B	a	a	b	b	c	c	B	...
...	B	X	X	X	X	X	B	B	...



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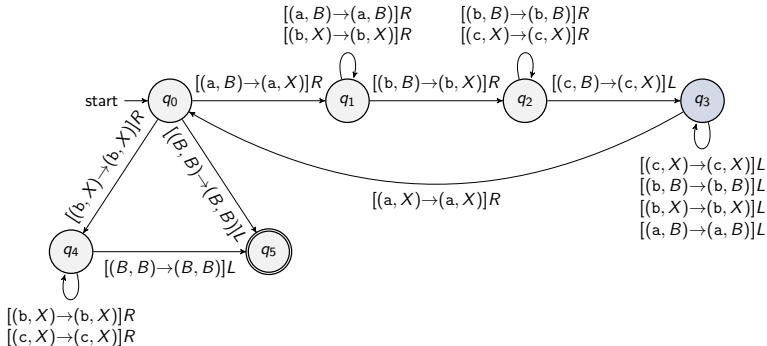
...	B	a	a	b	b	c	c	B	...
...	B	X	X	X	X	X	B	B	...



Construct a Turing machine that accepts the language:

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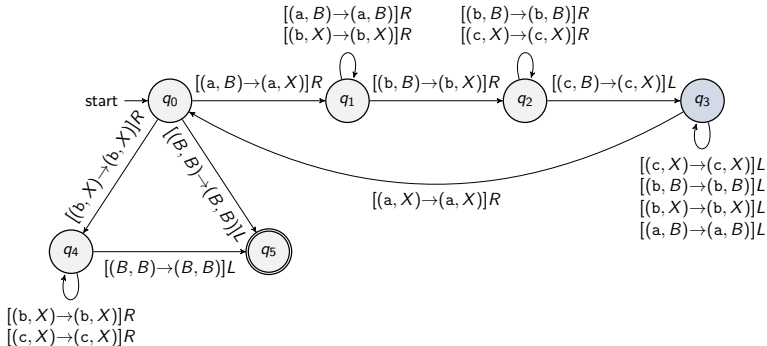
...	B	a	a	b	b	c	c	B	...
...	B	X	X	X	X	X	X	B	...



Construct a Turing machine that accepts the language:

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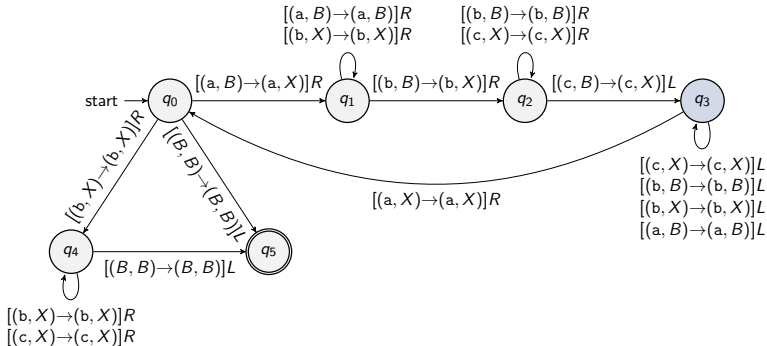
...	B	a	a	b	b	c	c	B	...
...	B	X	X	X	X	X	X	B	...



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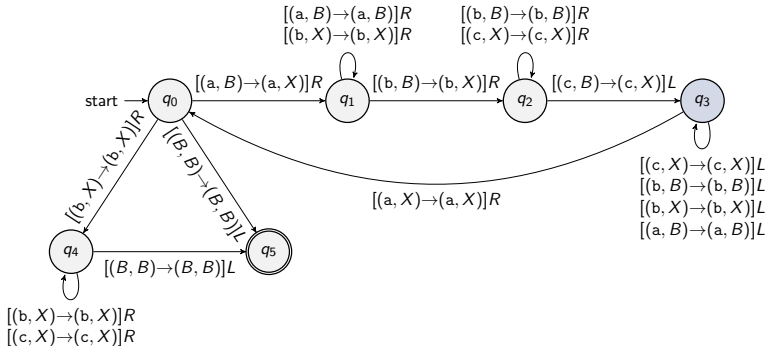
...	B	a	a	b	b	c	c	B	...
...	B	X	X	X	X	X	X	B	...



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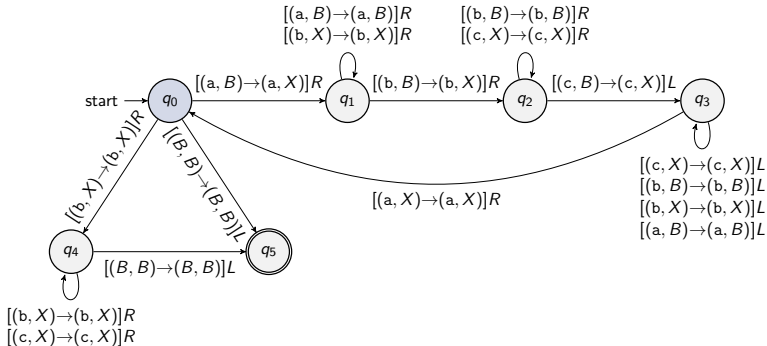
...	B	a	a	b	b	c	c	B	...
...	B	X	X	X	X	X	X	B	...



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...	B	a	a	b	b	c	c	B	...
...	B	X	X	X	X	X	X	B	...

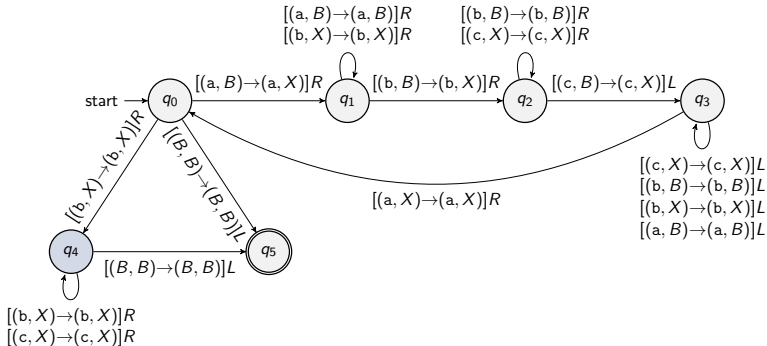


Now, no more unmarked a's. Check if all symbols are marked.

Construct a Turing machine that accepts the language:

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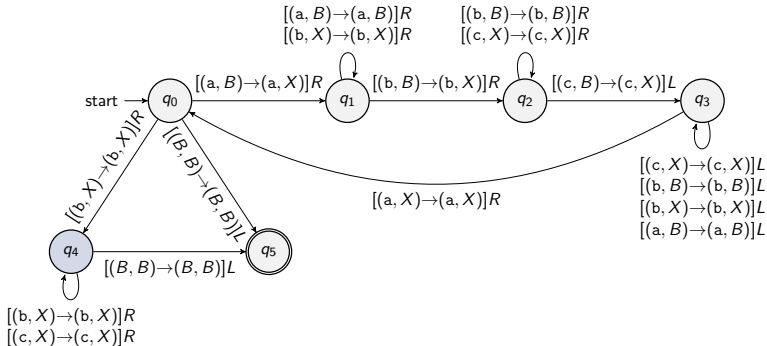
...	B	a	a	b	b	c	c	B	...
...	B	X	X	X	X	X	X	B	...



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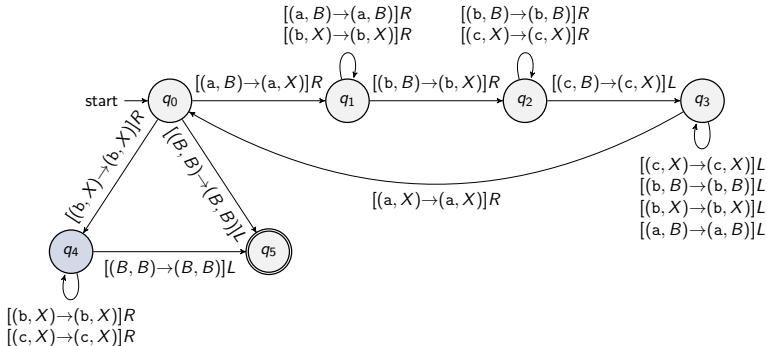
...	B	a	a	b	b	c	c	B	...
...	B	X	X	X	X	X	X	B	...



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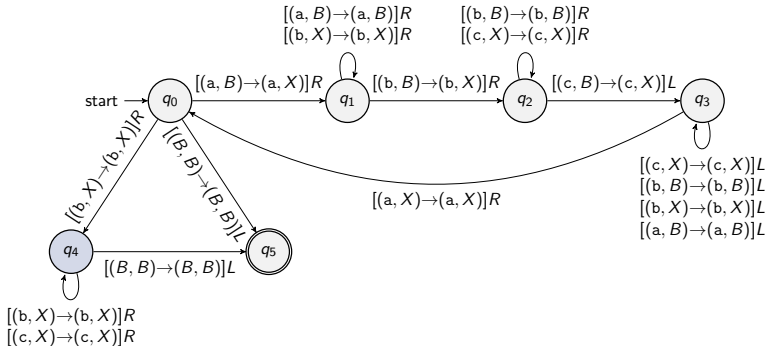
...	B	a	a	b	b	c	c	B	...
...	B	X	X	X	X	X	X	B	...



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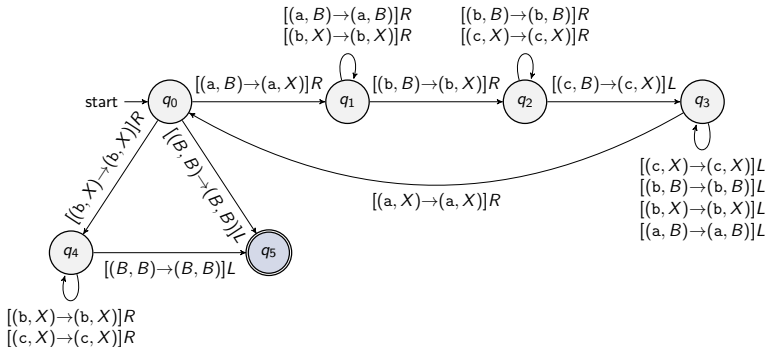
...	B	a	a	b	b	c	c	B	...
...	B	X	X	X	X	X	X	B	...



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$$L(M) = \{a^n b^n c^n \mid n \geq 0\}$$

...	B	a	a	b	b	c	c	B	...
...	B	X	X	X	X	X	X	B	...



Accept!