Construct a **Turing machine** that **computes** the function:

$$f(1^n{+}1^m) = 1^{n+m} \qquad \text{where} \qquad n, m \geq 0$$

$w =$

$\cdots$	B	1	1	1	+	1	1	B	$\cdots$

$f(w) =$

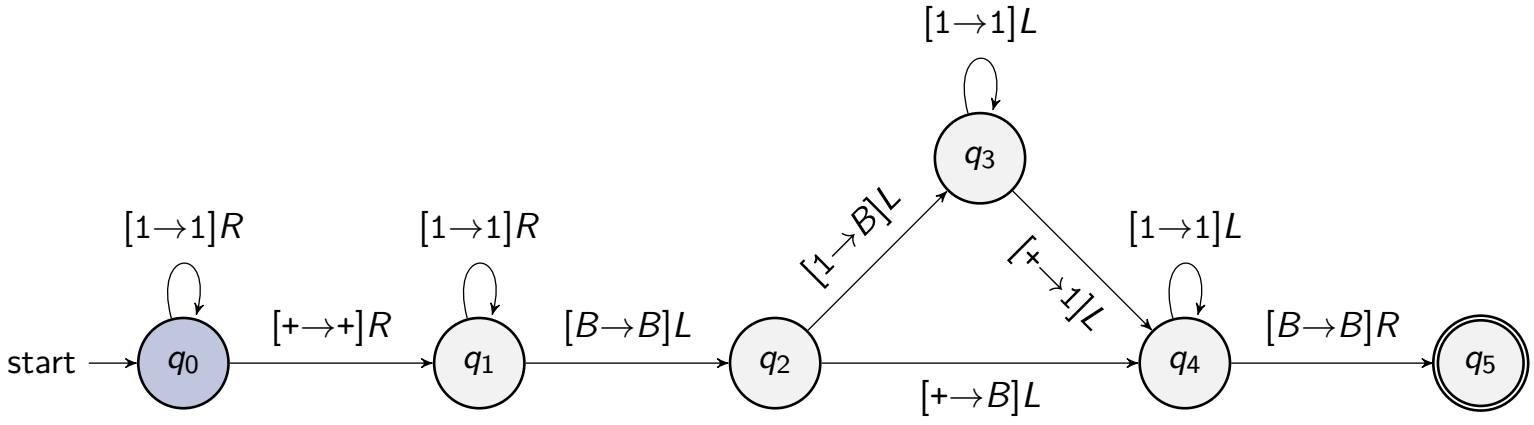
$\cdots$	B	1	1	1	1	1	B	B	$\cdots$

1: Find + after 1's
2: **if** the last symbol is 1 **then**
3: Find and Remove the last 1
4: Find and Replace the + with 1
5: **else**
6: Remove the +
7: Go to the first input symbol

Construct a **Turing machine** that **computes** the function:

$$f(1^n{+}1^m) = 1^{n+m} \qquad \text{where} \qquad n, m \geq 0$$

$\cdots$	B	1	1	1	+	1	1	B	$\cdots$



Find + after 1's.

Construct a **Turing machine** that **computes** the function:

$$f(1^n{+}1^m) = 1^{n+m} \qquad \text{where} \qquad n, m \geq 0$$

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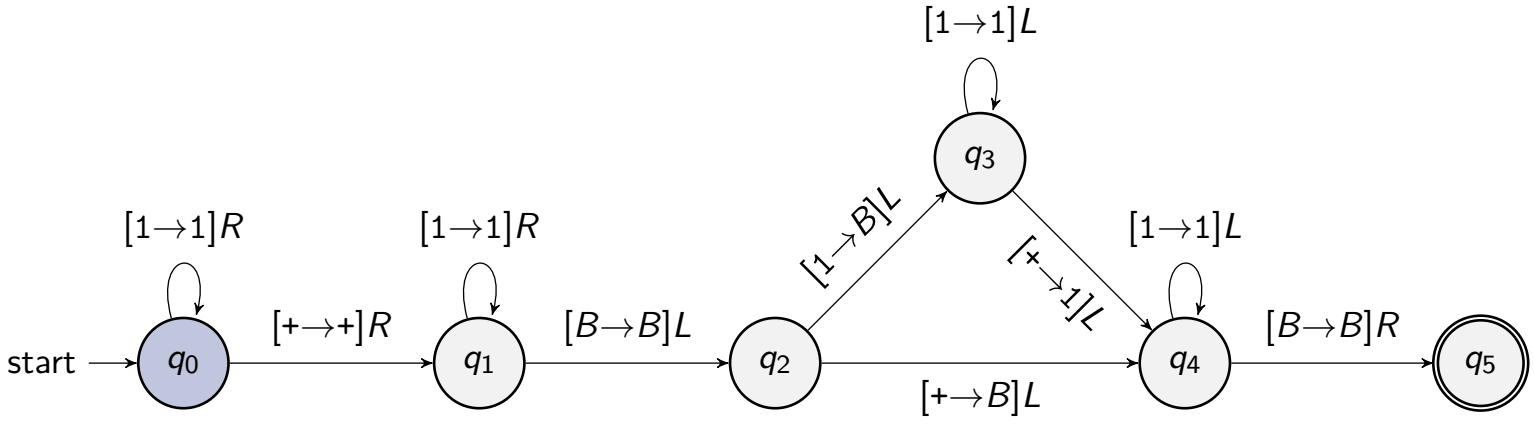

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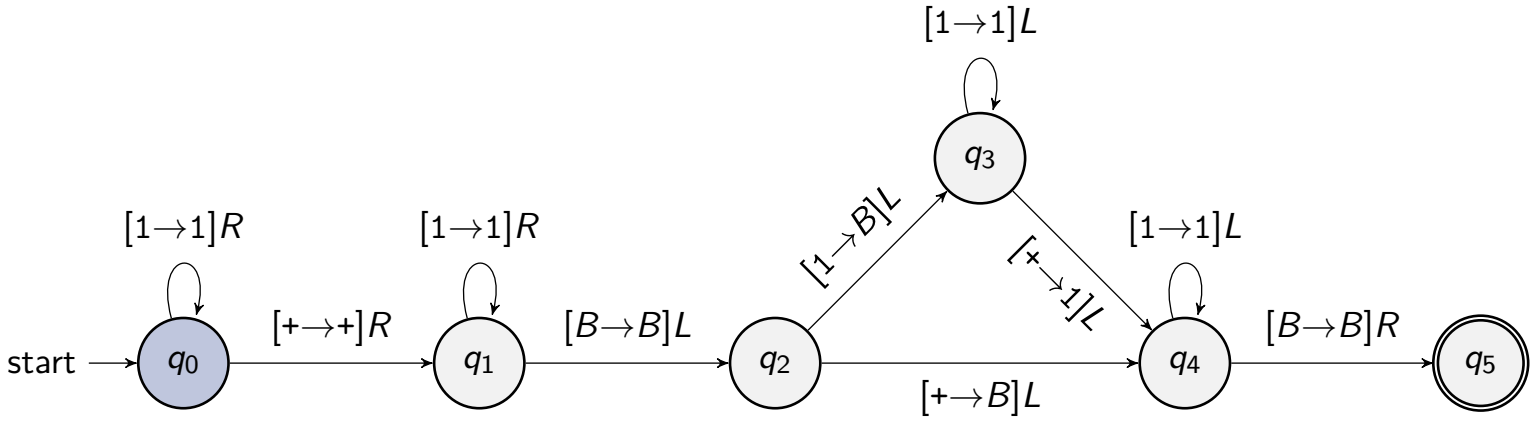

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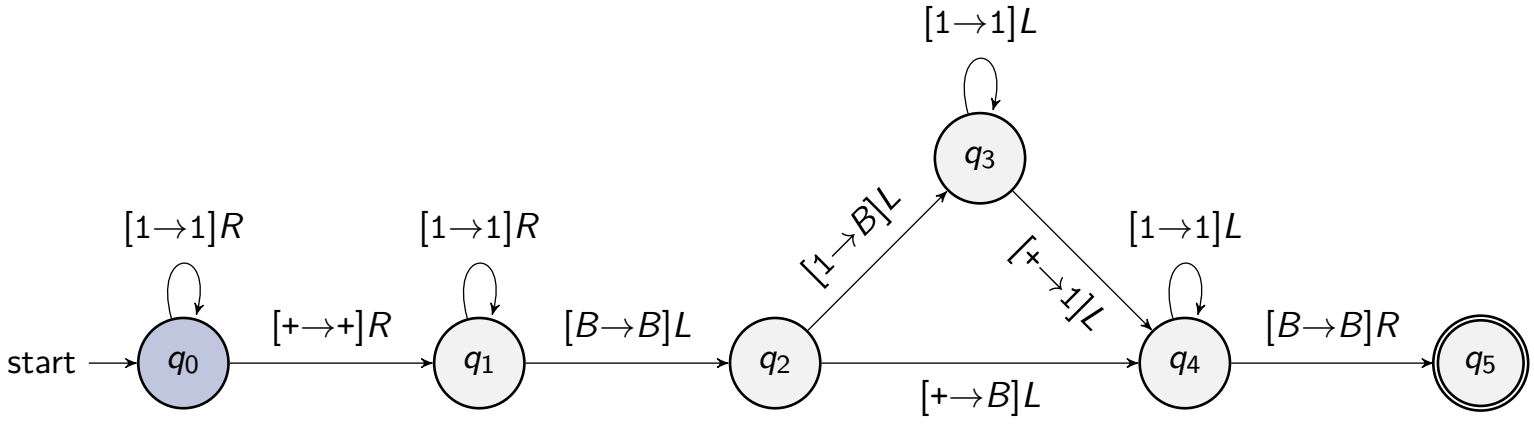

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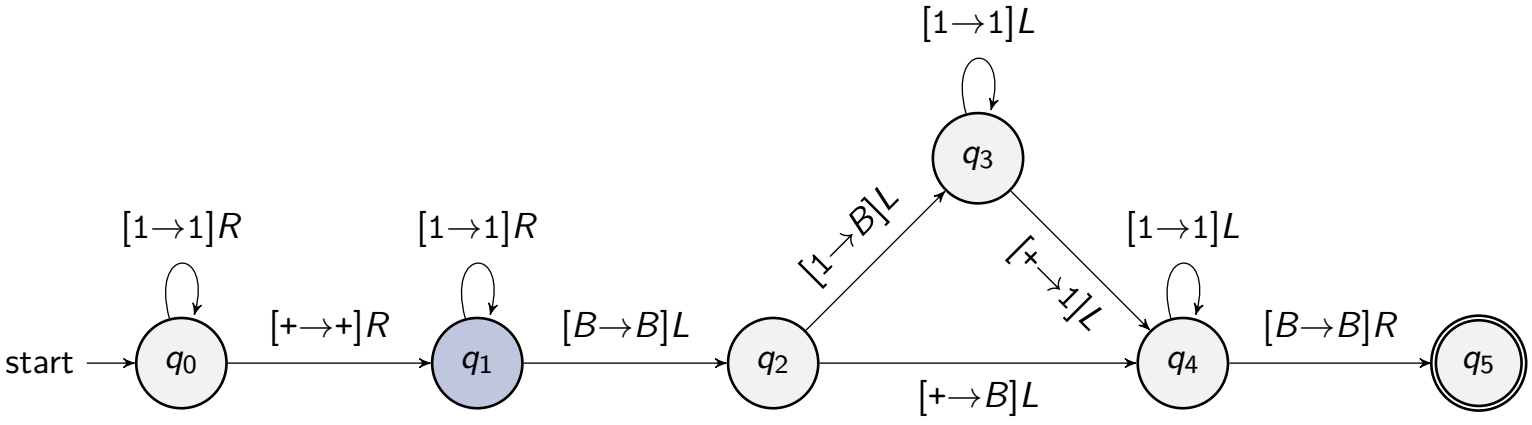
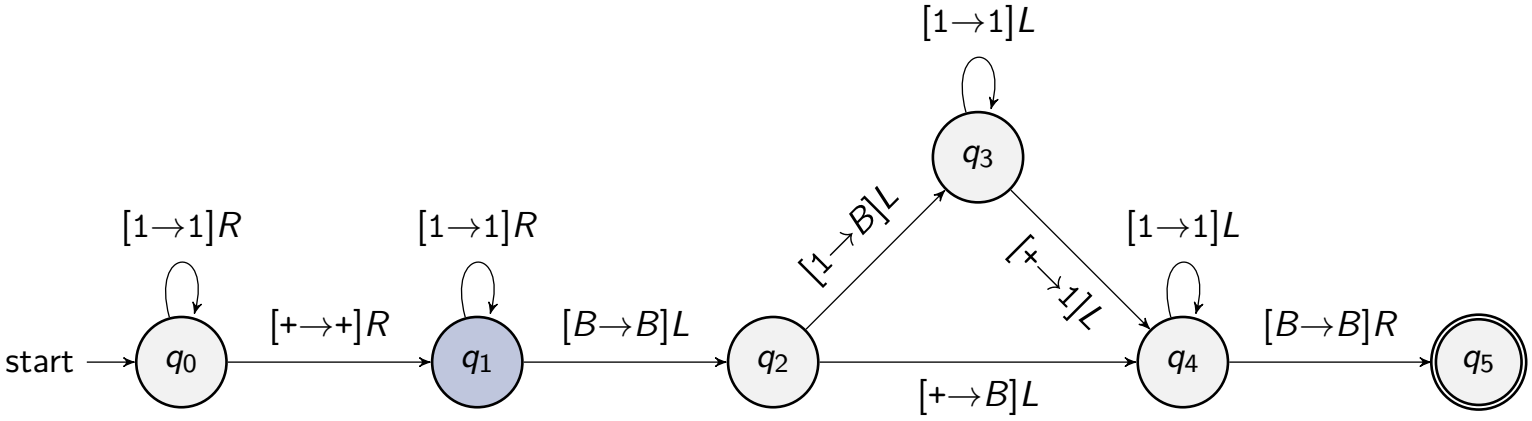


Check if all remaining symbols are 1.

Construct a **Turing machine** that **computes** the function:

$$f(1^n{+}1^m) = 1^{n+m} \qquad \text{where} \qquad n, m \geq 0$$



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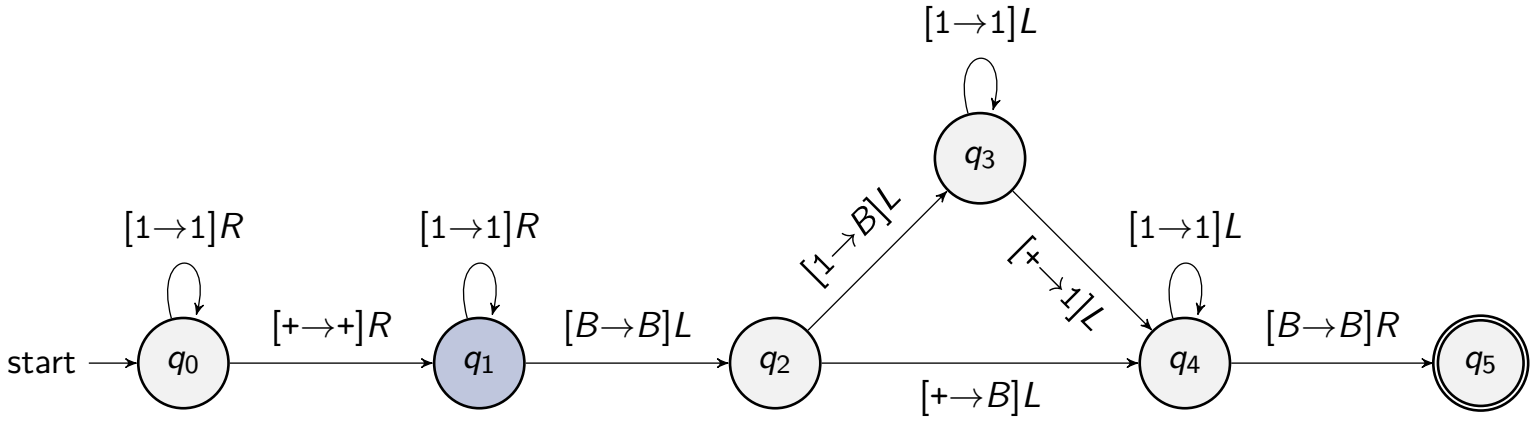

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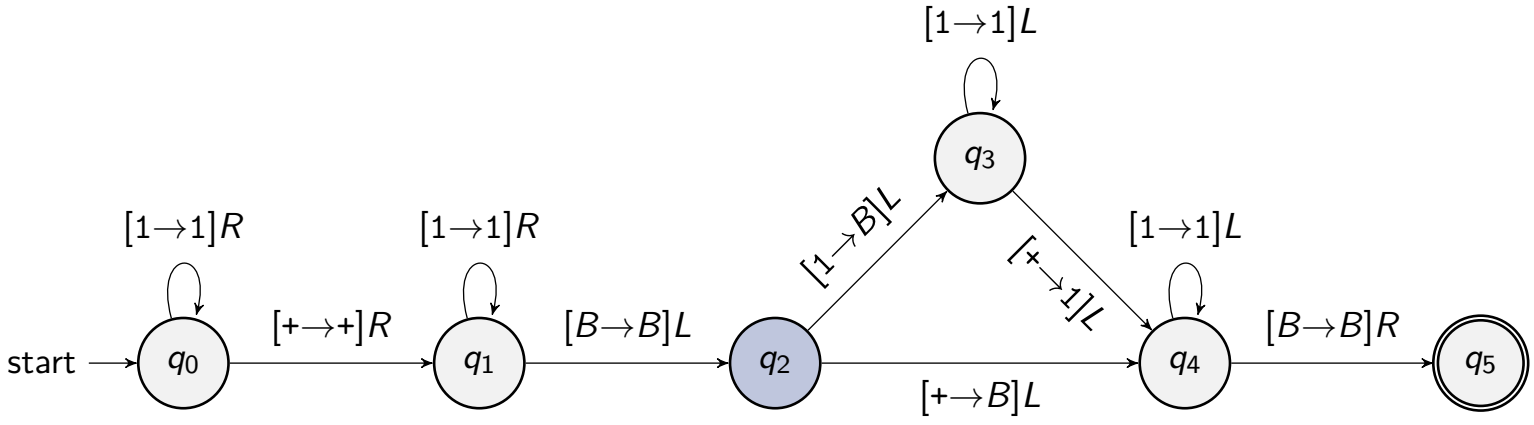
···	B	1	1	1	+	1	1	B	···

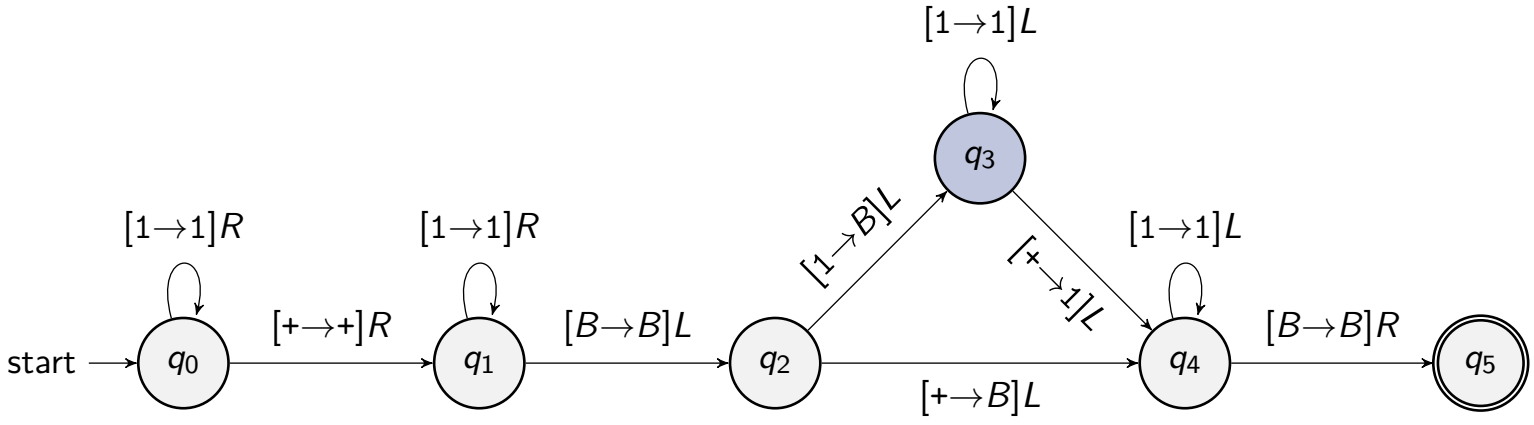


Since the last symbol is 1, find and remove the last 1.

Construct a **Turing machine** that **computes** the function:

$$f(1^n{+}1^m) = 1^{n+m} \qquad \text{where} \qquad n, m \geq 0$$

···	B	1	1	1	+	1	B	B	···

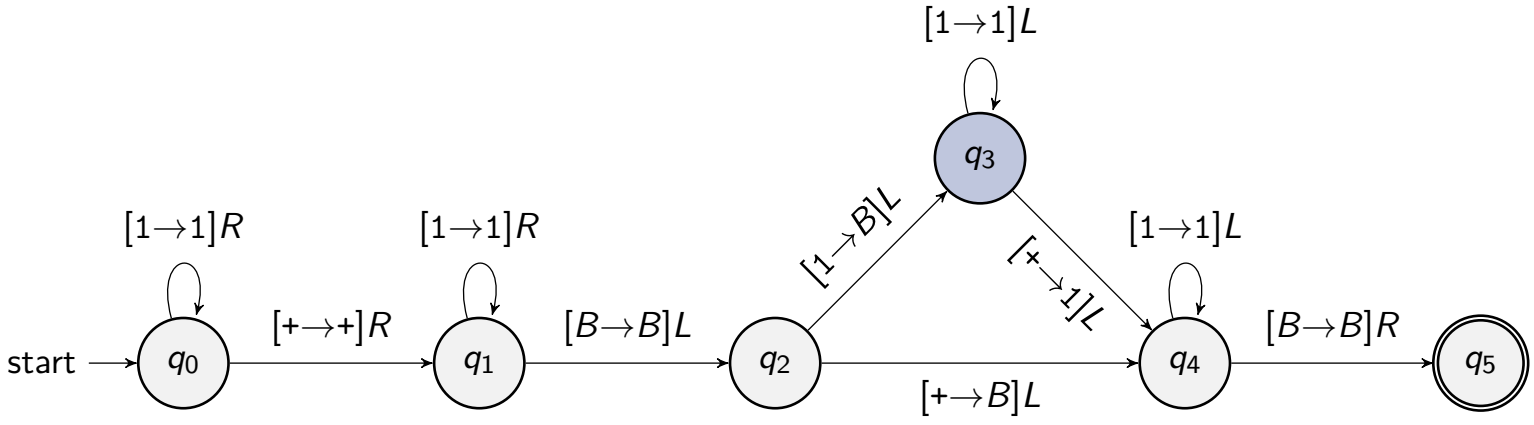


Find and Replace the + with 1.

Construct a **Turing machine** that **computes** the function:

$$f(1^n{+}1^m) = 1^{n+m} \qquad \text{where} \qquad n, m \geq 0$$

$\cdots$	B	1	1	1	+	1	B	B	$\cdots$



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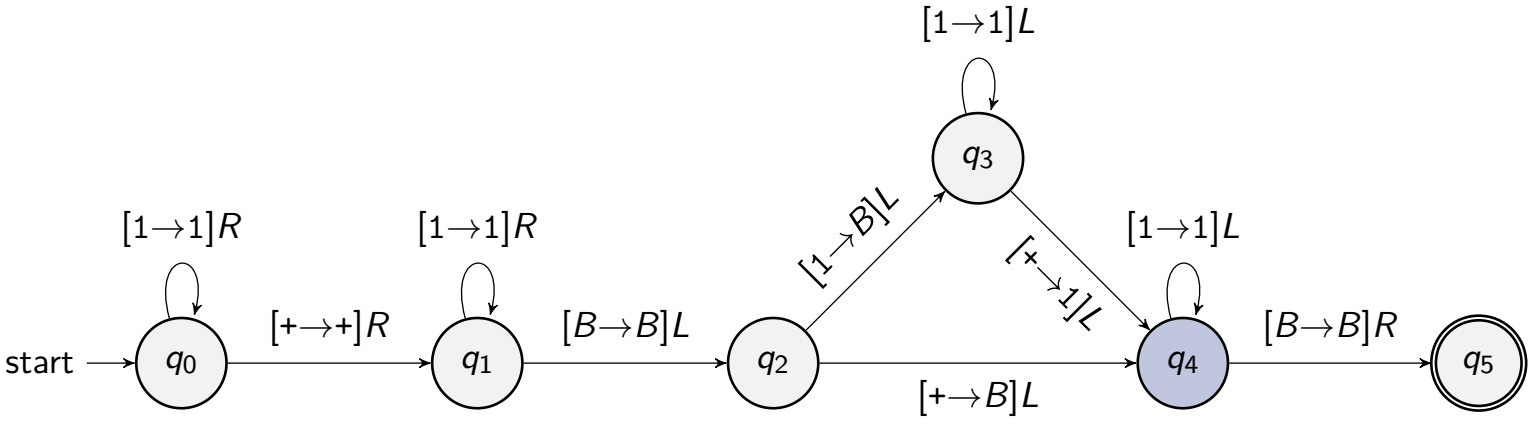
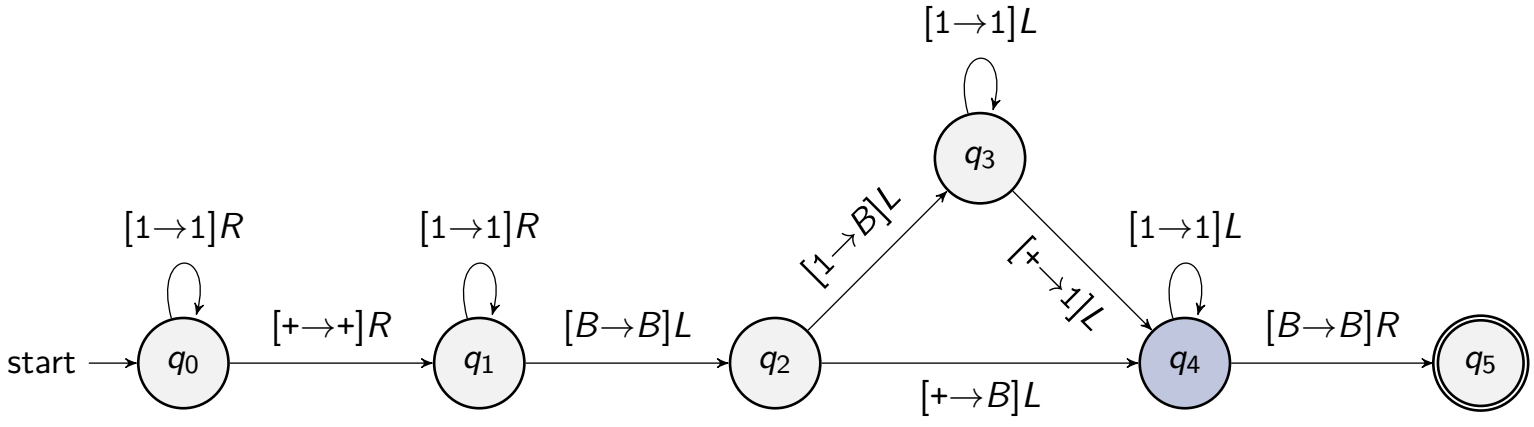


Go to the first input symbol.

Construct a **Turing machine** that **computes** the function:

$$f(1^n{+}1^m) = 1^{n+m} \qquad \text{where} \qquad n, m \geq 0$$

$\cdots$	B	1	1	1	1	1	B	B	$\cdots$



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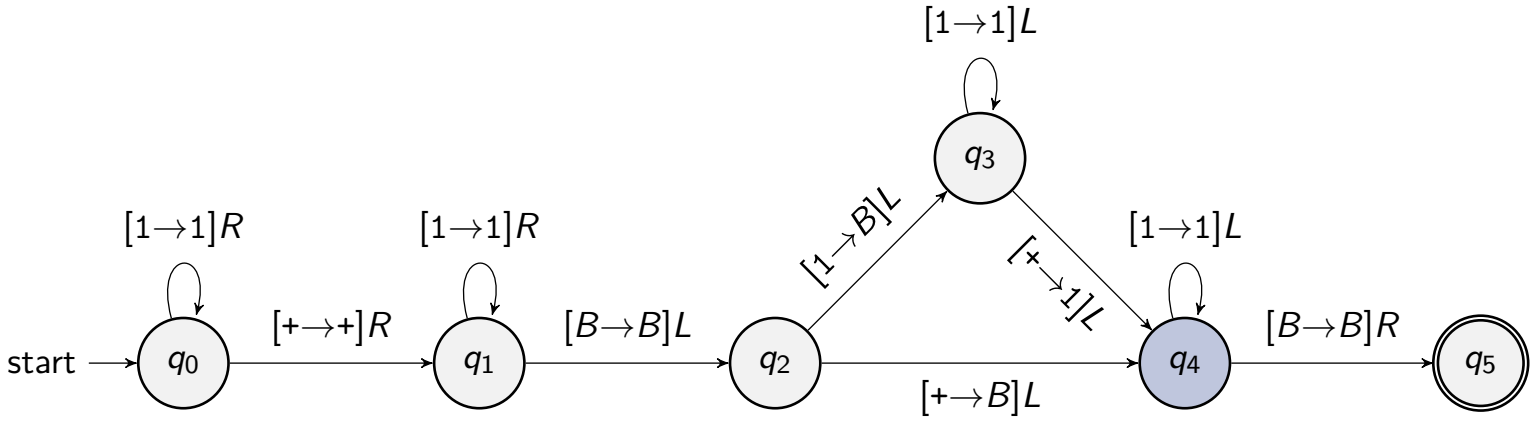

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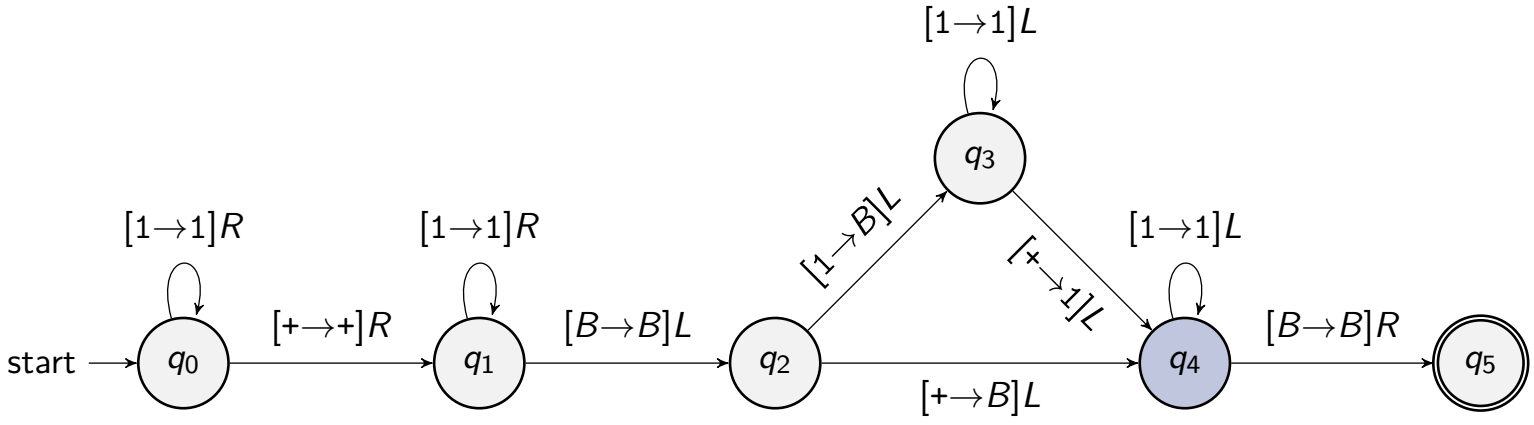

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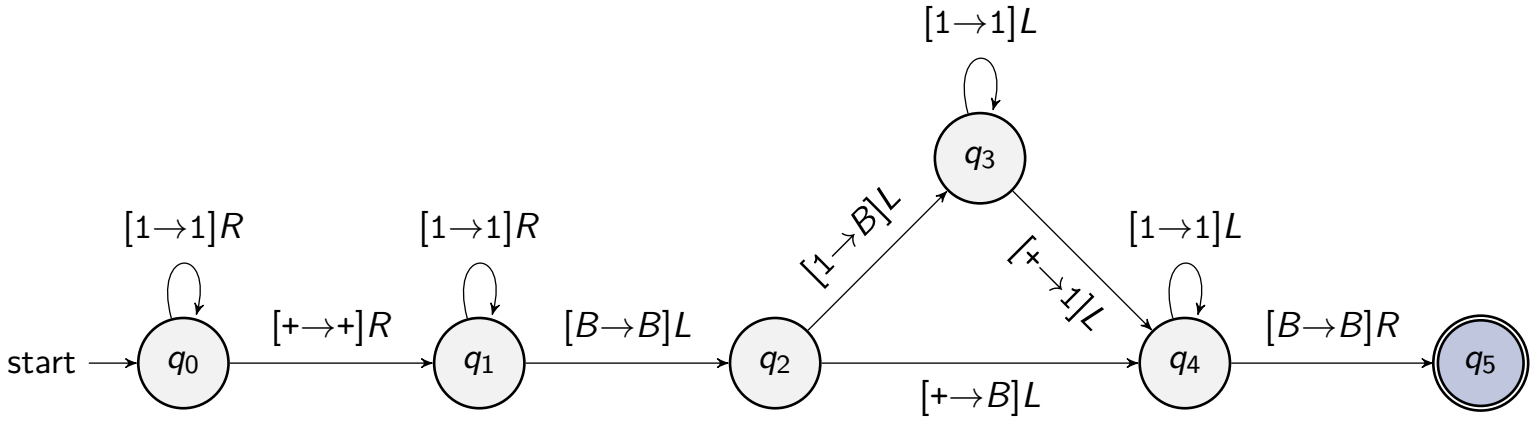

Computed! $f(111{+}11) = 11111$