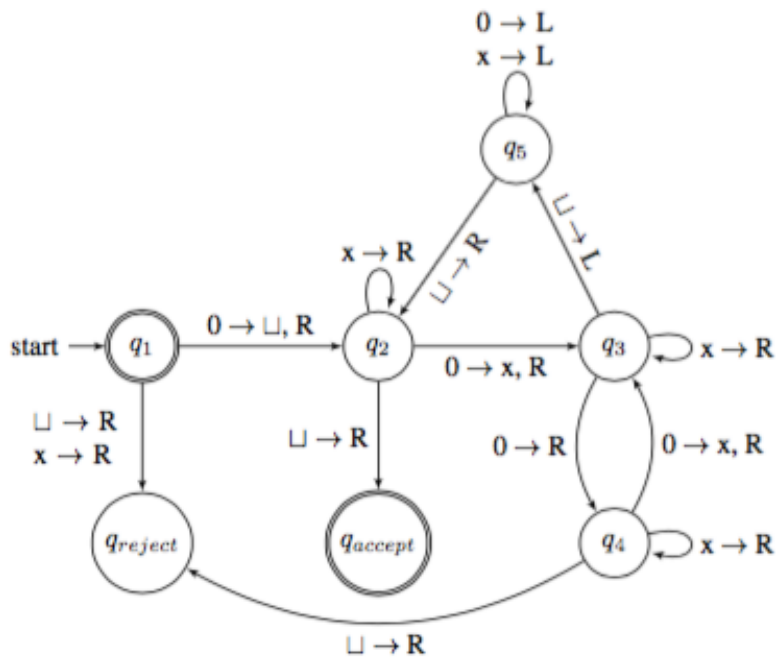


Chapter 3.1 Practice

Using the Turing Machine below, give the sequence of configurations leading to an accept or reject state.



1. 0
2. 000
3. 0000
4. 000000

Give implementation-level descriptions of Turing Machines that decide each of the languages below. (Hint: Start with a high-level recursive solution.)

5. All strings of a's and b's with an even number of a's and an even number of b's.

6. All strings of a's and b's with an odd number of a's and an odd number of b's.
7. Every string w of a's and b's with at least as many a's as b's.
8. $\{a^r b^s a^t \mid r \geq 0, s \geq 0, t \geq 0, s = 2r + t\}$
9. Palindromes on the alphabet $\{a, b\}$.
10. $\{c^r d^s c^r d^s \mid r \geq 0, s \geq 1\}$