# Exercise 13.1.18

Construct phrase-structure grammars to generate each of these sets.

We create a grammar .

Vocabulary:   
Terminals:

Starting symbol: S

Productions: will be different for each task.



# Exercise 13.4.6

Express each of these sets using a regular expression.

1. The set containing all strings with zero, one, or two bits
2. The set of strings of two 0s, followed by zero or more 1s, and ending with a 0
3. The set of strings with every 1 followed by two 0s
4. The set of strings ending in 00 and not containing 11
5. The set of strings containing an even number of 1s

# Exercise 13.4.16

Construct a regular grammar that generates the language recognized by the given finite-state machine.

Diagram

Description automatically generated

We have the grammar where:

Vocabulary:   
Terminals:

Starting symbol: S

Productions:

To explain the many productions;

From our starting symbol S we can do one of three things: Either terminate using the empty string or use a 0 and go to the final state (we call it A) or to the non-final state using a 1 (we call it B)

Whenever we are in the final state (A), we can use a 1 and stay in the final state or we can use a 0 and go to the state B. We can also terminate by using the empty string.

Whenever we are in the non-final state B, we can either use a 1 to go the final state A or we can use a 0 and stay in the non-final state B.