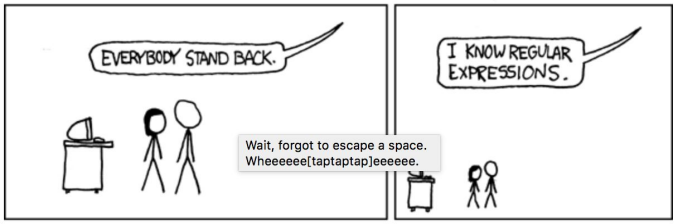
Regular expressions exercises

A **regular expression** is a code for a set of patterns in strings.



Regular expressions use the vertical line symbol "|" to mean "or". Thus (A|AA) matches the string A and also the string AA.

Regular expressions use the asterisk symbol "*" to mean "any number of the previous symbol, even zero". Thus ABC* matches the strings AB, ABC, ABCC, ABCCC, and so on.

Can you make a regular expression that does each of the following special things?

1. Accepts the strings (with the letters A,B only) that start with AB

   ANSWER: AB(A|B)*

2. Accepts the string that is your first name

3. Accepts only the strings AB, AAB, AAAB, AAAAB, AAAAAB, etc

4. Accepts only the string that is your first name, and the string that is your last name

5. Accepts only the strings with A only, with an odd number of A's

6. Accepts only the strings with A only, with an even number of A's

7. Accepts only the strings with A's and B's, with an odd number of A's and an even number of B's

8. Rejects only the string ABC, and accepts all other strings with the letters A, B, and C

9. Accepts the strings that have the same number of A's and B's

Question: What is the relationship between automata and regular expressions?