Exercise 1.1

1. Every premise of a valid argument is true. - **False** (It is not necessary that every sentence of a valid argument be true, only that *assuming all of the premises are true, it is impossible for the conclusion to be false.*)

2. Every invalid argument has a false conclusion. - False (Again, keeping in mind the definition of validity, it is only the case that it is *possible* for the conclusion of an invalid argument to be false when the premises are all true.)

3. Every valid argument has exactly two premises. - **False** (Nowhere in the definition of validity is there the requirement that valid arguments have *only* two premises. As we will see later in the course, there are valid arguments that have no premises, i.e. the null set, as well as valid arguments that have more than two premises. The definition of validity only defines the relationship between premises and conclusion; it makes no mention of number or premises.)

4. Some valid arguments have false conclusions. - **True** (Recall the definition of validity states the *an argument is valid iff it is impossible for the conclusion to be false when the premises are all true*. Assuming you have contradictory premises, i.e. they are mutually exclusive and cannot all be true at the same time, then the false conclusion presents no problem since the condition of validity is satisfied.)

5. Some valid arguments have a false conclusion despite having premises that are all true. **- False** (This is exactly the situation that marks the argument as *invalid*, the ability for the truth of the conclusion to not follow from the truth of the premises.)

6. A sound argument cannot have a false conclusion. - **True** (A sound argument is defined as *a valid argument with all true premises*. Given the definition of validity, it is impossible for a sound argument to have a false conclusion.)

7. Some sound arguments are invalid. - False (Given the definition of soundness, it is impossible for a sound argument to be invalid as *validity is a requirement for soundness*.)

8. Some unsound arguments have true premises. - **True** (An argument with all true premises and a false conclusion is invalid, and therefore also unsound.)

9. Premises of sound arguments entail their conclusions. - **True** (This follows directly from the definitions of soundness and validity.)

10. If an argument has true premises and a true conclusion, then it is sound. - False (An argument may have true premises and a true conclusion, but if there is even the possibility that the conclusion can be false when the premises are true, then it would be invalid, and hence unsound. Think of the example of the fallacy of *affirming the consequent* that we discussed today.)